FITNESS AND SPORT-SKILL OUTCOMES OF HIGH SCHOOL STUDENTS WITH SPECIAL NEEDS FROM A 10-WEEK INCLUSIVE INTRAMURAL BASKETBALL PROGRAM

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Dedicated to my family (especially to my grandparents who didn't have these same opportunities that I have been blessed with today) and to those who directly or indirectly helped me to become the professional I am today.

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ABSTRACT

Introduction: Physical activity (PA) and social interaction are essential to the health of individuals with and without disabilities alike. Unfortunately, individuals with disabilities have fewer opportunities to participate in PA. The purpose of this study was to examine the effects of a 10-week inclusive basketball program for students with special needs on fitness and sport-skill outcomes. Additionally, this study aimed to describe the changes in heart rate (HR) and rating of perceived exertion (RPE) reporting throughout the 10-week program.

Methods: The intervention consisted of three stages: skill-based learning, modified game play, and combination – skill and modified game play. These stages included lessons that were expected to illicit low moderate, high moderate, and moderate-to-vigorous physical activity (MVPA) levels of physical activity respectively. During the 10-week intervention, HR and RPE data were collected during each session while fitness and skill assessments were conducted pre- and post- intervention. A single subject range bound changing criterion design was used to assess HR and RPE, while nonparametric statistical tests assessed differences in stage, fitness, and sport skill outcomes.

Results: Visual inspection of the data demonstrated behavior stability near the MVPA range and the highest percentage of conforming data (PCD) was seen in stage 3. Verification of the data was observed as all data in stage 1 was lowest across all stages. A chi-square between stages test found significant differences (p=0.00) in the PCD between stages. Extremely low correlations (r=-0.13 to 0.14) were found between reported RPE with HR. Aerobic fitness did not increase *(p*=0.69) but decreases in one-mile run/walk times were observed. Basketball individual ball skills and offensive play did not improve (*p*=0.063 and *p*=1.0 respectively); however,

individual defensive skills (p=0.046) did improve. Social validity questionnaires indicated positive outcomes and support for the intervention.

Conclusion: The intervention did promote greater levels of physical activity intensity, in the MVPA range, and improved individual defensive play in basketball for students with special needs. Both students with special needs and special education teachers felt the intervention and basketball program increased sport skills and positive affective outcomes and would like to expand extra-curricular activities opportunities in schools.

TABLE OF CONTENTS

List of Tables

List of Figures

Figure **Page**

Chapter I

Introduction

Physical activity (PA) and social interaction are essential to the health of individuals with and without disabilities alike. It is globally accepted that regular physical activity is essential to maintain a healthy body weight and body composition to lower the risk of hypertension, obesity, and numerous other negative health impacts while also promoting inclusion, minimizing deconditioning of muscles, and optimizing physical functioning in children with disabilities (Katzmarzyk et al., 2015; Murphy & Carbone, 2008). Social interaction through physical activities and integrated team sports help to limit social exclusion and have numerous benefits that include physical health, cognitive and academic development, mental health, crime reduction, and reduction of truancy and disaffection (Bailey, 2005).

To improve health related outcomes associated with PA, and increase levels of physical fitness, it is recommended that individuals meet recommended PA levels of frequency, intensity, and time. The Centers for Disease Control and Prevention (CDC) recommends that children participate in 60 minutes of at least moderate to vigorous PA (MVPA) every day, including at least 3 days of bone strengthening and 3 days of muscle strengthening exercise per week, while adults should attain at least 150 minutes of MVPA a week and include at least two days of bone strengthening activities (https://www.cdc.gov/physicalactivity/basics/). However, there are many challenges in monitoring exercise intensity, especially for individuals with intellectual disabilities (ID) mainly due to their compromised cognitive functioning. It has been found, though, that rating of perceived exertion (RPE) scales are useful in this population because the individual can subjectively express how they feel during the exercise and RPE has a linear

relationship to HR (Stanish & Aucoin, 2007). And thus, fitness assessments can be used to measure exercise adherence.

Unfortunately, in the United States, obesity rates are on the rise across all age groups. For example, Ogden, Carroll, Kit, and Flegal (2016) analyzed the data from the National Health and Nutrition Examination Survey to determine that in 2011-2012, 16.9% of 2- to 19-year-olds were obese. Furthermore, in general, individuals with disabilities have less opportunities to be physically active and thus have a higher prevalence of overweight and obesity rates than their non-disabled counterparts (Rimmer, Rowland, & Yamaki, 2007; McCoy, Jakicic, & Gibbs, 2016). Parent and teacher support coupled with greater opportunities to practice skills after school in structured, and accessible programs, that are able to make appropriate modifications, which promote social interaction will help to build feelings of competence and autonomy, associated with self-efficacy and a positive attitude towards being active during one's leisure time are needed (Vierling, Standage, & Treasure, 2007).

One of the few, and the most prominent, organized recreational sporting program that students with disabilities have available to them is Special Olympics and now Special Olympics' Unified Sports programs. These programs have grown internationally over the past few years (Pan & Davis, 2015). Unified Sports has been shown to be a positive social inclusion environment that has the ability to make positive changes to attitudes, confidence, communication skills, self-esteem, fitness, and sports skills of all participants (Wilski, Nadolska, Dowling, McConkey, and Hassan, 2012). Although this community based program has a variety of positive benefits to participants, many of these opportunities do not translate to participation in school-based activities and interscholastic events that promote school spirit, pride, and school-community belonging.

Currently, interscholastic events target, and are geared towards, not only the able-bodied students but the top athletes and performers in and out of the classroom. For instance, often times, inclusion on a high school team means that you are physically superior to your peers and can perform the given sport-skill at an above average ability. Additionally, you are in good academic standing and can cognitively understand and apply tactical concepts with some ease. This current design of interscholastic athletic participation limits inclusion and opportunities for all students to gain health and social related benefits of physical activity.

This inclusive basketball program, offers interscholastic athletic participation opportunities for students with special needs similar to the design used with Special Olympics' Unified Sports program and especially the Prime Time Sports curriculum. Students with special needs are those who may have intellectual or physical disabilities that prevent them from having an opportunity to participate on their high school (HS) interscholastic teams. The impact of this project also creates the following ancillary benefits for students with disabilities: (1) create equal opportunity and access to afterschool programs (extracurricular activities, including team sports); (2) provide a venue for afterschool programming for those in need (Office of Civil Rights, http://www2.ed.gov/about/offices/list/ocr/letters/colleague-201301-504.html) requirements; (3) expand opportunities for all students (those who cannot make it on a varsity team can elect to serve as a peer coach); (4) impact quality of life for students with disabilities through continued physical activity development and participation; and (5) promote school spirit and pride. This design, modeled after Team Prime Time Games High School League, where at-risk youth are paired with students with developmental disabilities to form "Varsity" teams that play against other high schools to provide the interscholastic athletic experience (Prime Time Games High School League, www.teamprimetime.org).

Coaches at any level can also be terrific role models and help the individuals they work with learn to lead positive lives. Interscholastic sports have the ability to promote and enhance sport skills, physical fitness, confidence, and many more positive affects as well as life skills, lessons, and morals. Hence, participating in interscholastic sport programs have multiple benefits and should be encouraged for individuals of all abilities (Lumpkin & Stokowski, 2011).

It is therefore essential that this study be conducted to describe fitness and sport-skill outcomes of the 10-week basketball program that promotes inclusion and provides needed extramural physical activity opportunities for students with disabilities. Additionally, this project will analyze three teaching methods: skill-based learning (traditional style of skill and drill), modified game play, and a combination of skill and modified game play, on physical activity intensity and will determine if the participants can accurately report RPE using the modified OMNI Run/Walk scale.

To this end, the purpose of this study was to examine the effects of a 10-week inclusive basketball program for students with special needs on fitness and sport-skill outcomes. Additionally, this study aimed to describe the changes in HR and RPE reporting throughout the 10-week program.

The specific research questions are:

1. What effects did the intervention have on average HR for participants?
2. What effects did the intervention have on RPE for participants?
3. Were the participants able to accurately assess exercise intensity using the modified Children's OMNI Run/Walk Scale?
4. What aerobic fitness effects did the program have on its participants?
5. What sport-skill effects did the program have on its participants?

Delimitations

There were a number of delimitations on this study:

1. Participants used a wrist-worn heart rate monitor to limit invasiveness and ease of use.
2. A four-point modified RPE scale was used as validated in a similar adult population.
3. One school setting was used, purposely selected based on population of interest and support of the school administration and special education department.
4. Intervention was implemented across the whole class and as a result no randomization groups or random assignment were formed.

Limitations

There were a number of limitations to this study:

1. The program consisted of 23 meeting days with approximately 45 minutes of "practice" time.
2. The setting for intervention sessions were either in the gym or on the outside basketball courts based on availability. This environmental change may have influenced both heart rate and RPE.
3. Heart rate was averaged from three time points over the course of the lesson. Depending on where the student was in the activity or what the student was doing in the activity, prior to the time collection may have affected the heart rate.
4. Unavoidable absenteeism due to camp, illness, field trips, etc. were evident and excluded some participants from inclusion in data analysis.

Chapter II

Review of Literature

Introduction

This chapter provides an overview and critique of the literature related to physical activity among youth with disabilities. It begins by presenting literature regarding the relevant laws surrounding physical activity and education. Following physical activity for children and adolescents with disabilities a description and discussion of fitness, activity monitoring and assessments, and measuring exercise intensity is provided. Then, literature on perceptions of physical activity that have been identified as correlates, determinants, and/or mediators of physical activity among children and adolescents with disabilities is reported. Finally, a chapter summary is provided.

Laws Pertaining to Disabilities, Sport and Physical Activity

Section 504. The Rehabilitation Act of 1973, specifically Section 504, was of particular interest to advocates of individuals with disabilities. Section 504 of the Rehabilitation states that, "No otherwise qualified individual with a disability…shall solely by reason of her or his disability be excluded from the participation in, be denied benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program or activity conducted by any Executive agency or by the United States Postal Service (29 U.S.C.A. § 794)" (https://www.dol.gov/oasam). Section 504 covers all individuals of any age that has a disability defined as, having "a physical or mental impairment that substantially limits one or more of such person's major life activities, has a record of such impairment, or is regarded as having such impairment" (Rehabilitation Act, § 706[8]; Smith, 2001). These major activities include activities that one may do on a daily basis such as eating, walking, talking,

thinking, sleeping, standing, breathing, etc. Section 504 of the Rehabilitation Act, enforced by the Office of Civil Rights, was essential in paving the way for nondiscrimination of individuals with disabilities to access Federally funded and run programs, including education. Although Section 504 has its roots in education, it also reaches into athletics and extracurricular activities as well.

Section 504 has important implications for students with disabilities as it first and foremost granted greater and equal access to participation in a wide variety of educational and non-educational activities and services (Schilling & Coles, 1997). These activities include, "health services, recreational activities, athletics, student employment, clubs, specific courses, and field trips" (Smith, 2001). The participation in such activities may be separate or different than those offered to students without disabilities but they must be comparable and the difference must be necessary to ensure safety and or health of those individuals participating in the activity (French, Henderson, Kinnison, & Sherrill, 1998).

Seth M. Galanter, Acting Assistant Secretary for Civil Rights, wrote a Dear Colleague Letter that addresses Section 504 and provides guidance for public elementary and secondary schools that must follow the obligations of Section 504's regulations. Additionally, he cautions against making decisions based on presumptions and stereotypes, summarizes and details Section 504's regulations that require students with disabilities to have equal opportunities to participate in nonacademic and extracurricular services and activities, and clarifies the separate or different athletic opportunities provision. In summary, schools must provide a venue for afterschool programming for those in need (Office of Civil Rights, http://www2.ed.gov/about/offices/list/ocr/letters/colleague-201301-504.html).

The 504 mandate, applies to all recreational and competitive sport and sport training, however, it does not mandate that all individuals with disabilities can participate in all activities. Schools and other agencies can use the "otherwise qualified" criterion to grant access or participation in extracurricular activities (Smith, 2001). This means that if an individual is not otherwise qualified (despite his/her disability), then it is not considered discrimination to deny access to that particular activity. The "otherwise qualified" wording is also used with the Americans with Disabilities Act (ADA) which tends to disqualify students with special needs from traditional interscholastic athletic participation.

ADA. The passing of this act meant that for the first time in history, the legislature passed a nondiscrimination act that affected the private sector and ensured accessibility to, "parks, zoos, gymnasiums, convention centers, libraries, fitness centers, stadiums, and other private facilities…" for individuals with disabilities (Americans with Disabilities Act, 1990). Specifically, the ADA requires equal opportunities for individuals with disabilities in the areas of: public accommodations, employment, transportation, State and local government services, and telecommunications, recreation, technology, service animals, and ticket sales (Department of Justice, 2010). These accommodations, to be made, greatly expand access and opportunities for inclusion in not only our nation's schools but also in everyday life including athletics and extracurricular activities.

Individuals with Disabilities Education Act of 2004 (IDEA). IDEA was reauthorized in 2004 to ensure free appropriate public education (FAPE), to be implemented by highly qualified teachers, and to improve the educational and life outcomes of children and youth with disabilities (http://idea.ed.gov).. FAPE puts an emphasis on individualized programing to meet each child's specific needs and utilizes special education and related services as a vehicle to get

this done (Yudin & Musgrove, n.d.). Moreover, IDEA requires that schools provide special education services in the least restrictive environment, to students who qualify and must provide the following: an Individualized Education program (IEP), annual goals and objectives, mandatory parental meeting, and Individualized Transition Plans. IDEA has put an emphasis on transitional planning for high schoolers that is intended to promote community involvement, particularly in recreation and leisure participation. Students who are 14 years and older must have recreation/leisure addressed as part of their individualized transition plan (ITP) in their individualized educational plan (IEP) (Murata, 1999). This fulfills a need to directly address educational outcomes of high school students with disabilities as they relate to post-secondary and vocational training, community involvement, and relevant employment. Physical activity should be focused on age-appropriateness and functionality to enhance health, community involvement, and other quality of life related indices (Murata, 1999).

Trends in Legislation – Maryland. An example of this type of inclusion and progressive legislation is seen in the 2008 Maryland Fitness and Athletic Equity Act for Students with Disabilities that "requires local boards of education to develop policies to include students with disabilities in all curricular and extracurricular physical education and athletic programs. Specifically, the schools must provide students with reasonable accommodations to participate, the opportunity to try out for school teams, and access to alternative sport programs" (Office of Special Education & Rehabilitation, 2011). Although we see similar language in federal legislation, specific directive such as this, in Maryland, will aid in the breaking down of barriers to inclusion in curricular and extracurricular activities.

Inclusion

Physical education has been an ideal education setting for inclusion because of its social nature and its tendency to increase social inclusion and a sense of communal belonging to their peer communities (Tant & Watelain, 2016). While social inclusion is important as part of a student educational milieu, physical activity and health related activities are specific requirements as indicated by IDEA (2004) since physical education is the only content area mentioned within the definition of special education. To this, physical education is a required content area for all students with IEPs. Consequently, curriculum models such as Tactical Games, Sport Education, and Cooperative Learning are student-centered curriculums that have been shown to promote and enhance cognitive, social, and physical skills (Dyson, Griffin, & Hastie, 2004). Within these types of curriculum models, fits the SPARK curriculum, that has also shown positive effects on MVPA compared to usual skill and drill type classes (Lonsdale et al., 2013). The SPARK lessons include skill and fitness activity components have been shown to significantly increase physical activity and MVPA in physical education classes (Locke & Lambdin, 2003; Sallis et al., 1997). Moreover, these models and instructional approaches have also been used to successfully promote inclusion in the physical education classrooms (Hodge et al., 2012). Additionally, peer tutoring, has been shown to be effective in developing skills and activity levels as well as increasing positive interactions and strengthening relationships between students in inclusive physical education settings (Tant & Watelain, 2016; Qi & Ha, 2012; Cervantes, Lieberman, Magnesio & Wood, 2013).

Although mandated by law (see previous discussion under Section 504 and Trends in legislation - Maryland), there remains much fewer extracurricular opportunities for individuals with disabilities than there are for individuals without disabilities (McCoy, Jakicic, & Gibbs,

2016; Rimmer & Rowland, 2008; Rimmer, Rowland, & Yamaki, 2007). There is a need for more programs that are accessible and have the capability to adapt activities for inclusion of all children that will also help to promote social inclusion (Barr & Shields, 2011).

Special Olympics is the most notable and recognizable physical activity outlet for individuals with disabilities, mainly intellectual disabilities, but besides this organization there are not many others who cater to the physical activity needs of this population. An intellectual disability is defined as "a condition characterized by significant limitations both in intellectual functioning and in adaptive behavior, which includes a range of daily social and practical behaviors" (Hodge, Lieberman, & Murata, 2012). 1999 marked the inception of Special Olympics, Unified Sports. This inclusive sports program aims to team up athletes with disabilities with partners, athletes without disabilities, throughout competition and training in order to promote friendships, understanding, and social inclusion. From 2011-2015, Unified Sports has grown by 9% (Pan & Davis, 2015).

The popularity of unified sports spans across different activities and across countries around the world because of its many physical, social, and cognitive benefits to participants with and without disabilities. Wilski, Nadolska, Dowling, McConkey, and Hassan (2012) conducted and recorded 221 interviews with Special Olympics' Unified Sports athletes. The participants reported that fitness, technical ability, confidence, self-esteem, communication skills, and attitudes were all improved by participation. Because, teamwork and trust were of utmost importance friendships were developed and became a vital part of participation. They also reported that the Unified Sports programs across Europe also increased accessibility to sports facilities and social venues. Furthermore, an 8-week Unified Sports soccer program that met three times a week for an hour and a half, increased fitness and sport skill scores across twelve to

fifteen year old males (Baran et al., 2013). Moreover, Unified Sports programs have been shown to decrease problem behaviors for youth participants with ID and that participation increases social competence and attitudes of all participants (Ozer et al., 2012).

Although the benefits are wide and many, one of the most important benefits of the Unified Sports program is the social inclusion aspect. McConkey, Dowling, Hassan, and Menke (2013) conducted a study in which nearly 40 athletes, partners, coaches, parents and community leaders from five countries: Germany, Hungary, Poland, Serbia, and Ukraine participated in interviews regarding their participation in Unified Sports and the qualitative data was analyzed. Themes that emerged were increases in personal development, the creation of inclusive and equal bonds, positive perceptions of athletes, and building of alliances within local communities. Additionally, Sullivan and Glidden (2014) found that introducing collegiate swimmers to a unified swimming program intervention positively increased comfort level with social interactions ($p<.05$) between all swimmers and collegiate swimmers described improved attitudes ($p<.01$) towards Special Olympic swimmers.

Social Implications. Physical activity and social interaction are essential to the health of individuals with and without disabilities alike. Social interaction through physical activities and integrated team sports help to limit social exclusion and have numerous benefits that include physical health, cognitive and academic development, mental health, crime reduction, and reduction of truancy and disaffection (Bailey, 2005). Ensuring social interactions for children and adolescents with their peers and encouraging positive PA experiences can be especially beneficial to children engaging in PA (Barr & Shields, 2011).

Interscholastic sports have the ability to promote and enhance sport skills, physical fitness, confidence, and many more positive affects as well as life skills, lessons, and morals.

Coaches can be terrific role models and help the individuals they work with learn to lead positive lives. Hence, participating in interscholastic sport programs have multiple benefits and should be encouraged for individuals of all abilities (Lumpkin & Stokowski, 2011).

Physical Activity

Physical activity (PA) is very important to one's overall health. The World Health Organization (WHO) defines PA as, "any bodily movement produced by skeletal muscles that requires energy expenditure." (http://www.who.int/topics/physical_activity/en/). Physical inactivity is a modifiable risk factor that is associated with a variety of chronic diseases such as cancer and cardiovascular disease. However, physical activity, whether it is structured exercise or every day, unplanned, intermittent activities can be beneficial to one's overall health. The benefits of exercise and PA are dose-dependent but can help to deter chronic illness and premature death (Miller et al., 2016). Activities such as walking, gardening, biking, swimming, and playing recreational sports are physical activities that people of all ages can participate in to achieve such health benefits.

Physical Activity Recommendations. The Centers for Disease Control and Prevention (CDC) recommends that children participate in 60 minutes of PA every day, including at least 3 days of bone strengthening and 3 days of muscle strengthening exercise per week. The CDC also recommends that most of this activity should be in the moderate to vigorous physical activity (MVPA) levels. Furthermore, adults should get at least 150 minutes of MVPA every week (in at least 10-minute bouts of activity) and include at least 2 days of muscle strengthening activities (CDC, 2015).

Moderate –to-Vigorous Physical Activity (MVPA) and Energy Expenditure (EE). MVPA is typically defined by the MET intensities, $\geq$ 3 METs. (CDC, 2015). Moderate activity starts at 3 METs, while vigorous activities start at 6 METs. In order to fully understand MVPA, and the METs involved, it is also important to define a MET and how it is derived. 1 MET is equal to 3.5 ml of oxygen uptake per body weight per minute (3.5 ml/kg/min). This is the standard used in terms of volume of oxygen consumed at rest (sitting quietly), or an individual's resting metabolic rate (RMR). This RMR of 3.5 ml/kg/min is based on a 70 kg adult at rest. (Byrne, Hills, Hunter, Windier, & Schutz, 2005). MVPA can also be measured by calculating target heart rates and estimating maximum heart rates or by using a RPE scale (https://www.cdc.gov/physicalactivity/basics/measuring/index.html).

Physical Activity Recommendation Adherence. Katzmarzyk et al. (2015) used a cross-sectional, multinational study to determine the relationships between lifestyle behaviors and body composition (obesity) in children from Australia, Brazil, Canada, China, Columbia, Finland, India, Kenya, Portugal, South Africa, United Kingdom, and the United States (N=7372 [6539 complete data and used in analysis], ages 9-11). Lifestyle behaviors were described by MVPA, VPA, and sedentary time that was measured by the use of wrist-worn accelerometers. Accelerometers were to be worn 24 hours a day and every day of the week; however, minimal accepted data was considered four consecutive days of wear for at least 10 waking hours and including at least one weekend day. Anthropometric height and weight data were also recorded for each participant to calculate BMI. Findings suggested that 55 minutes per day of MVPA is associated with lower incidence of obesity and supports the current recommendations. Additionally, higher levels of MVPA and VPA were related to lower chances of obesity, independent of sedentary behavior (Katzmarzyk et al., 2015).

Troiano et al. (2008) analyzed accelerometer date in a sample of representative US youth (~1,800 and adolescents) from the 2003-2004 National Health and Nutritional Examination Survey (NHANES) to determine adherence to the recommended 60 minutes of MVPA per day. The results indicated that only 42% of children (6-11 yrs) obtained the recommended amount of MVPA. In contrast to that, only 8% of adolescents (12-15 yrs) obtained the recommended amounts of MVPA. They also found that people youth and adolescents tend to overestimate self-report amounts of PA and youth and adolescents also tend to overestimate self-report amounts of PA. During play, children are more likely to sustain moderate intensity physical activity rather than vigorous physical activity (Tompkins, Flanagan, Lavoie, & Brock, 2015).

As such, in the United States, obesity rates are on the rise across all age groups. For example, Ogden, Carroll, Kit, and Flegal (2016) analyzed the data from the National Health and Nutrition Examination Survey (NHANES) to determine that in 2011-2014, 17% of 2- to 19-year-olds were obese and 5.8% were classified extreme obese (BMI ≥ 120% of sex-specific 95th percentile on the CDC BMI-for-age growth chart). Although increases, decreases, and leveling off of obesity rates have been seen throughout the years, most recently no significant obesity trend have been seen between 2005-2006 and 2013-2014 (p=.09-.87).

Children and Adolescents with Disabilities and Physical Activity. Children with disabilities can specifically benefit from PA participation because it can promote inclusion, minimize deconditioning of muscles, optimizes physical functioning, and enhances overall well-being of the individual (Murphy & Carbone, 2008). However, there are fewer PA opportunities for children and adolescents with physical and cognitive disabilities and higher prevalence of overweight and obesity compared to their non-disabled peers (Rimmer, Rowland, & Yamaki, 2007). Rimmer and Rowland (2008), reviewed various health sources and summarized that these

PA trends can be explained by barriers to PA that include: physical, programmatic, and attitudinal barriers to participation in community-based sport and recreation programs.

Over 80% of individuals with learning disabilities do not engage in the minimum levels of physical activity that is recommended by health organizations (Hallawell, Stephens, & Charnock, 2012). Similar results have been found in youth with ID in Taiwan where only 8% of adolescents in the study met recommended PA guidelines (Lin et al., 2010). Furthermore, individuals with profound intellectual and multiple disabilities (PIMD) that reside in a Dutch residential facility did not exert HR that accounted for more than 50% of their HR reserves for 30 consecutive minutes (Waninge et al., 2013).

This trend was also seen in individuals with autism spectrum disorder (ASD). McCoy, Jakicic, and Gibbs (2016) used the 2011-12 National Survey of Children's Health to gather and analyze data for 42,747 adolescents (ASD, n=915) in order to make comparisons of obesity, PA, and sedentary behaviors between adolescents with and without ASD. After analyzing the data and adjusting for covariates: age, sex, race, educational setting, household income, and highest level of education in household they found that adolescents with ASD were more likely to be underweight, overweight, and obese ($p<.02$) and less likely to engage in PA ($p<.01$). Additionally, higher ASD severity was significantly associated with decreased PA, sport, and club participation ($p<.001$).

Fitness

Physical fitness is measured by cardiovascular endurance, muscular endurance, muscular power, muscular strength, flexibility, balance, speed of movement, reaction time, and body composition (CDC, 2015). It is also described as the ability to have energy and alertness in performing tasks of daily living, and with enough energy to pursue and enjoy leisure time

activities or respond to emergencies (Powers & Howley, 2007; CDC, 2015). To improve physical fitness, it is recommended that one exercise and meet recommendations for frequency, intensity, and time. Of those, intensity proves to be the one that most people have trouble adhering to and/or measuring.

VO_2max. Measurement of oxygen consumption is a measure of aerobic ATP production and this measurement of aerobic metabolism, of an individual at rest, provides an estimate of the body's baseline energy requirement (Powers & Howley, 2007). Prolonged exercise and physical activity increases the body's need for energy that is produced aerobically, thus requiring the aerobic metabolism to increase (Powers & Howley, 2007).

Maximal oxygen uptake (VO_2 max) is a reproducible measure of the greatest amount of oxygen uptake by the body during severe or exhaustive, dynamic exercise (Morrow, Mood, Disch, & Kang, 2016; Powers & Howley, 2007). It is also a measure of the ability of the cardiovascular system to deliver oxygenated blood to muscles during movement (Powers & Howley, 2007). As such, VO_2 max is, "generally considered to be the best single marker for the functional capacity for the cardiorespiratory system" (Dencker et al., 2008). Graded exercises tests, typically performed on treadmills or cycle ergometers, are often used to measure one's VO_2 max or cardiovascular fitness (Powers & Howley, 2007). Breath-by-breath measurement of respiratory gas exchange is considered the most valid and reliable measurement of VO2max in adults but has been more difficult to measure in children because compared to adults, children have a different breathing pattern both at rest and during exercise (Reybrouck, Deroost, & Van Der Hauwaert, 1992). However, Reybrouck et al. (1992) were able to conclude from their study that despite the differences between breathing patterns of adults and children, breath-by-breath measurement can be used accurately and reliably for respiratory gas exchange measurements.

VO2 max is largely dependent on maximal cardiac output and the maximal arteriovenous oxygen difference (Powers & Howley, 2007).

The main indicator that a VO_2 max measurement is achieved is seen when the work rate or load is increased, but the oxygen consumption does not increase or in other words, has reached a plateau. Other indicators of one reaching his or her VO_2 max is an RER > 1.1, a post-exercise blood lactate level of >8mmoles/liter, heart rates that near age-predicted maximal levels, and a subjective measure of a self-report that he or she could not sustain the work load any longer (Morrow et al., 2016; Powers & Howley, 2007). The respiratory exchange ratio is the ratio of carbon dioxide output to the volume of oxygen consumed and this ration helps us to understand the primary fuel source that is being utilized during rest and exercise: fat or carbohydrates (Powers & Howley, 2007). The higher the ratio (approaching 1.0), the more carbohydrates are being used as a fuel source opposed to fat, and the lower the ratio, the more fat is being used as opposed to carbohydrates (Powers & Howley, 2007).

VO_2 max is an effort dependent measure of aerobic fitness, meaning, when directly measured, the participant must put forth maximal effort. With the aforementioned criteria, children, adolescents, and overweight individuals do not typically meet the objective measures to attain true VO_2 max (Roberts et al., 2009). When the physiological criteria for VO_2 max assessment are not met, the measured greatest oxygen consumption achieved is then called VO_2 peak, which is highly correlated with VO_2 max and is a valid measure of an individual's aerobic capacity (Rowland, 2013; Morrow et al., 2016). VO_2 peak is considered a more appropriate measure for determining the aerobic fitness in children (Baxter-Jones & Maffulli, 2003).

Monitoring Exercise Intensity

Heart Rate. Heart rate and exercise intensity has been shown to have a strong positive relationship (Morrow, Mood, Disch, & Kang, 2016; Powers & Howley, 2007). However, target heart rate estimations, using a percentage of maximal heart rate (most commonly used 220-age), have been proven to have substantial errors in prediction. Due to these errors in prediction, Tanaka, Monahan, and Seals (2001) used a meta-analysis approach to collect group means for maximal heart rate values and found that there is a strong relationship between maximal heart rate and age (r= -0.90) when using the equation 208 - 0.7xAge. The group mean values were cross-validated in a laboratory setting used to collect maximal heart rates from 514 healthy subjects and found a virtually identical regression equation to the one found during the meta-analysis. Their findings indicate that the equation 208 – 0.7xAge can predict maximal heart rates in healthy adults, and that age is the primary predictor of maximal heart rate and is independent of gender and habitual PA status. Furthermore, Mahon, Marjerrison, Lee, Woodruff, and Hanna (2010), also found that the 208 - 0.7xAge equation can predict maximal heart rate in children by using a sample of 52 children (7-17 yrs). These findings suggest that the target heart rate should be used as a guideline for exercise intensity and can be used with other information to determine a reasonable estimate of exercise intensity (Arena, Myers, & Kaminsky, 2016; Powers & Howley, 2007; Tanaka et al., 2001).

Heart rates between 50-70% of maximal heart rate, using the formula 220-age, can be defined as moderate intensity physical activity, while heart rates 70-85% of maximal heart rate can be considered vigorous intensity PA. However, obese individuals, when compared to healthy weight individuals incur greater physiological strain and increased metabolic cost during exercise, which can sometimes make exercise more unpleasant (Tompkins, Flanagan, Lavoie, &

Brock, 2015). Furthermore, when children of all body compositions were allowed to choose what unstructured activities to participate in, mostly comprised of free-play, significantly higher moderate to vigorous physical activity levels were observed when compared to organized and structured physical activity sessions (Trost, Rosenkranz, & Dzewaltowski, 2008).

Individuals with disabilities, specifically mental retardation and Down syndrome, have lower levels of cardiorespiratory fitness and lower maximum heart rates found during exercise testing (Fernhall et al., 1996). Fernhall et al. (2001) conducted a maximal exercise treadmill test using a n=572 (with MR n = 276; 97 with DS and without MR n = 296) with an age range of 9-46yr. Results showed that maximum heart rate can be predicted with similar accuracy in populations with and without mental retardation (ID) using Y=210-(0.56age)-(15.5DS), where R=0.57 and p<.01 (Fernhall et al., 2001). However, it is suggested that this method be used as a guideline for exercise prescription and when exercise testing is not feasible.

Along those lines, Waninge et al. (2013) conducted a study using N=24 with profound intellectual and multiple disabilities (PIMD) (6 women-mean age 30±17 yrs and 18 men- mean age 36±15 yrs). All participants were recruited from a Dutch residential care facility. HR was measured and collected by the Polar RS 800, 8 times a day, over the period of eight days, during regular daily activities. No interventions except "care as usual" were given or prescribed. HR zones were calculated using an estimate of participant's peak HR (210 - 0.56(age) – 15.5) derived for individuals with intellectual disabilities, resting HR (determined by averaging 15 morning HR measurements before any activity performed), and then the resting HR was subtracted from estimated peak HR to determine HR reserve which was divided into 10 zones. The continuous HR measurements were converted into HR zones per 15-minute intervals and in this way, 32 calculated HR zone measurements were calculated each day. Physical activity was

also recorded every 15 minutes by the use of a PA questionnaire. Results found that time of day and age both had significant influences ($p<.05$). Interestingly, further results noted that the older someone was, the less active they tended to be. Participants were also more physically active in the morning (9-11am). Overall, findings suggest that participants did not exert HR that accounted for more than 50% of their HR reserves for 30 consecutive minutes (Waninge et al., 2013)

Heart Rate Monitors. Heart rate monitors (HRM) have been very popular in the PA research setting for many years. They are the most common monitors in the research setting, because of their accuracy, however, until recently they required two devices to be worn on the body. The first, is the transmitter, worn around the chest of the participant, which must be a little moist when first put it on, and should have direct contact with the skin (whenever possible). The second device is the monitor, which is typically worn around the wrist, similar to a watch. The transmitter registers the electrical impulses from the heart and sends that directly, and continuously to the monitor. Data are outputted in beats per minute and can be collected instantly or downloaded at another time. HRM can also be used with some oxygen analyzers and can transmit the HR data to such analyzers. More recently, wrist-worn HRM have been put to market as a less invasive option. These are a favorable option for special populations as well as the general population as they do not require anything to be worn around the chest, but rather, just a watch-like device to be worn on the wrist.

Bassett (2000) showed that there is a linear relationship between HR and VO_2, which allows researchers to predict VO_2 across various exercise intensities. HRM also have its complications when it comes to usage in the research setting. A major limitation to the usage of HRM is the costs that are relatively expensive, often running in the hundreds of dollars. Also,

there are many variables that affect the results of HRM such as the time of day, length of wear, anxiety, stress, and variations of the HRM, amongst other variables (Rice & Howell, 2000).

Rate of Perceived Exertion. Dr. Gunnar Borg, was the pioneer in the measurement of perceptual effort during exercise testing to assess the mental perception of the body's intensity of physical work (Borg, 1962). Borg's 15-point, 6-20 RPE scale, ranges from 6-no exertion at to 19-extremely hard and 20-maximal exertion and has been used widely in exercise testing. When these values are multiplied by ten they are approximations of HR (Borg 1998). The Borg 6-20 ratings of perceived exertion (RPE) scale has been demonstrated to be a valid and reliable instrument to predict VO2max in healthy (active and sedentary) individuals in various submaximal activities (Coquart, Garcin, Parfitt, Tourny-Chollet, & Eston, 2014).

Since the Borg Scale came out, there have been other variations that have followed suit. For example, the 2008 Physical Activity Guidelines for Americans provided a simpler scale that identifies relative intensity, related to the individual's fitness level that ranges from 0-sitting, 5 to 6-moderate intensity, 7 to 8-vigorous intensity, 10-maximal effort (USDHHS, 2008). The RPE scales are popular in exercise testing because they have high correlations with other values of interest such as HR, ventilation, lactic acid production, percent VO_2max, and workload in normal adult populations (American College of Sports Medicine (ACSM), 2014). Of particular interest to this study are those scales that can be utilized for exercise prescription and exercise intensity management for the general population and special populations during regular physical activity such as the Children's Effort Rating Table (CERT), Eston-Parfitt Scale (EP), and Children's OMNI Scale.

Borg 6-20 RPE Scale (Use in Special Populations). Arnhold, Ng, and Pechar (1992) conducted an experimental study that examined the predictive ability of the Borg (6-20) RPE

Scale for mentally retarded (MR) young adults with respect to HR and workload. Subjects (n = 20 (10 adults who were mentally retarded (6 women and 4 men) mean age of 21.2 yrs, IQ=50.5; 10 non-retarded adults (6 women and 4 men) mean age 21.18 yrs)) went through the Balke protocol, a continuous multi-stage treadmill test) and had RPE and HR (chest worn monitor) recorded after each minute. The control group went through a variation of the Balke protocol that started at 3.5 mph at 0% grade of incline and increased by 1% incline every minute thereafter until completion. The experimental group completed a modified Balke that required participants to walk at 1.0 mph for the first minute and the speed was raised by 0.5 mph each subsequent minute up to 2.5 mph, after which point the grade was then raised by 2% each minute. The test was terminated if the subject reported a 20 on the Borg Scale or if their HR was above 85% of their maximum predicted HR. Control subjects test completion ranged from Stage 9 (3.5 mph, 8% grade) to Stage 18 (3.5 mph, 17% grade) and the experimental (MR) group ranged from Stage 10 (2.5 mph, 10% grade) to Stage 13 (2.5 mph, 16% grade). Significant positive correlations were found in both control and MR groups between RPE and HR (.82 and .65, $p < .01$) and RPE and workload (.87 and .81, $p<.01$). The amount of variation in RPE that can be accounted for and explained by the variation in HR and WL was found to be significant ($p<.01$). Fisher's z-transformations were also used to assess differences between the correlation coefficients for the control and MR groups. A significant difference was found between groups for the relationships between RPE/HR ($z = 2.85$, $p<.01$). No significant differences were found between groups for RPE/WL. Arnhold, Ng, and Pechar (1992) concluded that individuals with MR can report feelings of submaximal exercise intensities similar to their "normal" counterparts and that people who work with individuals with MR should respond to expressions of exertion appropriately.

Tompkins, Flanagan, Lavoie, and Brock (2015) conducted a study to: (1) determine whether healthy weight and obese children would engage in and sustain activity of moderate to vigorous intensity during a before-school, unstructured PA program, (2) to compare heart rate and RPE between healthy weight and obese children during the program, and (3) to evaluate the relationship between heart rate and RPE in an effort to further explore the use of the Borg scale in children. Twenty-one children were enrolled in the study were recruited from a local 3rd-5th grade school in Colchester, Vermont. Twelve children (4 males and 8 females) were classified as health weight (>5th-<85th) and nine children (6 males and 3 females) were classified as obese (≥95th) using age- and sex-specific body mass index (BMI) percentiles from the CDC. The 3-day/week (Tuesday, Wednesday, and Thursday), 45 minute, PA program was run for 8 weeks in the fall and 10 weeks in the spring of 2012 in the school gym. The sessions were supervised by trained study staff which included undergraduate and graduate UVM students from the Exercise and Movement Science program. Children were encouraged to play alone or with others and had a variety of activities and equipment to choose from. Each day they were equipped with Polar heart rate monitors and a watch so that they could track their own PA intensities, and reminded of their target heart rate which was 70% of their maximal heart rate. These THR values ranged from 147-149 beats per minute depending on age and a cut-point for moderate activity was determined to be 140 beats per minute. Staff monitored and manually recorded HR every 15 minutes for each child to assure heart rate monitor accuracy. After each session, each participant was shown the Borg RPE scale and asked to provide their overall RPE for that day and HR monitor data was downloaded. This study found that the participants were able to sustain at least moderate physical activity in 100% of the sessions but vigorous intensity in only 65% of the sessions. No significant differences were found in overall mean HR between the healthy weight

and obese children. However, significant differences ($p<.05$, $p=.017$) were found in the obese participants reporting lower RPEs than the healthy weight participants. Also, a medium correlation ($r=.41$) was observed between heart rate and RPE but was not statistically significance ($p=.06$) (Tompkins, Flanagan, Lavoie, & Brock, 2015).

Children's Effort Rating Table (CERT) Scale. Williams, Eston, and Furlong (1994) developed CERT in alignment with the Borg 6-20 scale. Observations of children (5 to 9 years) attempting to use the Borg scale found that cognitive development of children under 10 years of age was a barrier to use in young children but had a basic understanding of exercise and the feelings that accompany "hard work". This lead to a project entitled, "Exercise: how it makes you feel" was introduced to 257 children in two elementary schools in England. The children exercised in a playground by mainly walking, running, skipping, or jumping rope at different speeds and time periods. Shortly following the activities, they wrote about the exercise in class and were encouraged to draw pictures that depicted their efforts, and finally discussed those feelings with teachers and members of the research group. The CERT was then derived from the wording and expressions used by these children. The words were placed at each point on a numerical scale that corresponded to the range of HR values that might be observed in young children when they participate in physical activity of various intensities during play. The scale was then put through field trials in schools. Four groups from each grade comprised of 14 boys and 14 girls individually went through an incremental stepping-exercise protocol. The protocol required the child to step on-to and off-of a .28m high bench and in time with an electronic metronome at a rate of 25 steps per minute. Stepping was chosen because its ease of use, no complicated apparatus and young children can quickly comprehend the task. The exercise intensity was manipulated by increasing body weight by loading a backpack fitted to the subject.

Each subject completed four 2-minute bouts of exercise with load increases corresponding to 0, 5, 10, and 20% of the individual's body weight. HR was recorded throughout and RPE recorded during the final 15 seconds of each bout. Results found that exertion level and HR were correlated: Kindergarten r = 0.73, Grade 1 r = 0.95, Grade 2 r = .99, and Grade 3 r = 0.9 ($p<0.01$). Kindergarteners did not respond as predictably or consistently as the other children, most likely because of their cognitive development (Williams, Eston, & Furlong, 1994).

Eston-Parfitt (EP) Scale. Eston, Lambrick, and Rowlands (2009) conducted a study using 15 children (6 males; age: 7.5±0.5 years, and 9 females; age: 7.6±0.5 years) who performed a discontinuous graded exercise test to exhaustion using a cycle ergometer. Children were given a copy of the EP Scale to take home several weeks in advance of the start of the study and received verbal instructions on how to use the scale. They were also given standardized instructions on how to perform a marble task, which involved grabbing a preferred number of marbles (out of a possible 50 marbles) from a container and placing them into another container, according to their current perception of effort. The harder the exercise felt the more marbles they collected from the other container. All participants completed a 3-minute warm-up with a resistance of 15W, followed by a 2-minute rest. The graded exercise protocol was then applied and started at 10W for 1-minute, followed by a 1-minute period of unloaded cycling, and then work rate then increased by 10W for 1-minute, and procedure repeated until exhaustion. During the final 15 seconds of loaded cycling throughout the exercise test, the participant was asked to report their RPE using the two methods. The participant pointed to a spot on the scale and also completed the marble task after being asked the question, "How hard does the exercise feel to you?". The relationship between work rate and marble task was curvilinear (mean R^2=.94) and

strong linear (R^2=.93) and curvilinear (R^2=.94) relationships between RPE from the E-P Scale and work rate confirmed the validation of the E-P Scale.

Eston, Lambrick, and Rowlands (2009) concluded that the curvilinear E-P Scale is a valid instrument to provide estimates of perceived exertion in healthy 7-8 year olds. Children can understand the nature and purpose of the scale without prior bouts of active exercise familiarization and accurately estimate their perception of exertion throughout the test. The curvilinear relationships support the theoretical backing of the scale (Eston, Lambrick, & Rowlands, 2009).

CERT vs EP Scale. Lambrick, Bertelsen, Eston, Stoner, and Faulkner (2016) assessed both the CERT and the Eston-Parfitt (EP) Scale for use in estimating peak oxygen uptake (VO2peak) in children during treadmill exercise testing. Included in the study were 50 healthy children (n=21 boys, age: 9.4 ± 0.9 y; height: 1.42 ± 0.09 m; body mass: 41.6 ± 13.0 kg; body mass index: 20.3 ± 4.5 kg m^2; body fat: 26.1 ± 8.1%) who volunteered for the study. Participants performed one bout of a graded exercise test in a lab. Both RPE Scales were introduced and children were given a very thorough explanation and demonstration of how to use the scales. Oxygen uptake was collected using breath-by-breath analysis and heart rate data also collected. (Lambrick et al., 2016) concluded that the most accurate estimates of VO2peak were found using the extrapolation from EP 7 where measurements were within 10% of measured VO2peak.

Children's OMNI 1-10 Run/Walk Scale. Robertson et al. (2006) conducted a study using 44 healthy youth (22 males (12.7 ± 1.3 yrs), 22 females (12.8 ± 0.6 yrs)) who demonstrated sufficient cognitive ability to read out loud each verbal descriptor on the Children's OMNI Scale. Subjects did not have clinical, neuromotor, or cognitive contraindications to exercise testing. A cross-sectional, perceptual observation design was used to assess exertional perceptions during a

load-incremented progressive treadmill protocol that terminated at maximal exercise intensity. The graded exercise test started at a treadmill speed of 4.83 km/hr and 2.5% elevation and increased in speed and incline throughout with stage six ending at a speed of 7.5 km/hr and 12.5% elevation. The test was stopped when the subject reported or experience volitional fatigue. HR was measured during the last 15 seconds of each minute, VO_2 was measured each minute, and RPE was measured during the last 30 seconds of each minute. Subjects reported RPE by pointing to their RPE on the scale. The concurrent validation paradigm used in this studied utilized criterion (VO_2 and HR responses to the submaximal treadmill test stages) and concurrent variables (observer-estimated RPE-overall, RPE-legs, and RPE-chest). Positive correlation between criterion and concurrent variables provided evidence of validity. The observer was positioned at a 45-degree angle to the left front of the treadmill and did not move. The observer was not informed of the subject's RPE, VO_2, and HR responses and also wore headphones that prohibited hearing any treadmill or exertional noises. The observer was asked to record the three measures of RPE at the same time as the subject based on the subject contextual category which included: movement, facial, and breathing. Concurrent validity, determined by regression analysis by sex, found a positive linear relationship between observer-estimated RPE-overall, RPE-legs, and RPE-chest and both VO2 and HR ($p<0.01$). Construct validity, determined by regression analysis, found positive linear relationships between subject self-rated RPE and observer-estimated RPE ($p<0.01$) and non-significant results, respectively. ANOVA results indicated significant results for site ($p<0.01$) and stage ($p<0.01$) in both females and males, suggesting that from stages II-IV in females and III-V in males, RPE-legs differed from RPE-chest. Concurrent and construct validity of the Children's OMNI walk/run RPE scale for both

female and male ten to fourteen-year-old children performing treadmill exercise and suggests that direct kinematic coding may be useful in providing physical activity intensity estimates were reported (Robertson et al., 2006).

Stanish and Aucoin (2007) found positive associations were found among RPE, HR, and workload, which provides evidence that the Children's OMNI Scale of Perceived Exertion is an effective tool for adults with mild-moderate ID to subjectively estimate exercise intensity. Their study used, N = 18 adults (10 males, 8 females) with mild-moderate ID, and mean age of 34.7 ± 12.3 years. Significant positive values for Spearman's rho indicate that over half of the participants selected higher RPE values as heart rate and workload increased. Gender and IQ had no role in RPE values. They also note that it is important that recognize that age isn't always a good/sound predictor of maxHR in individuals with ID (Fernhall et al., 2001). Participants may be working closer to maximal capacity than their HR indicates. Knowing these things can help to facilitate independent engagement in physical activity.

Chen, Ringenbach, Snow, and Hunt (2013) investigated the effectiveness of a modified pictorial 1-4 RPE Scale to monitor the exercise intensity for people with Down syndrome (DS) (n= 19, mean chronological age 21.99±5.28 and mental age 6.09±1.78 years). The Children's OMNI 1-10 walk/run Scale was changed to a 4-point scale that consisted of pictures and verbal expressions such as "The task is easy for me". The participants performed a modified progressive walking protocol. Instructions about the scale were given and the participants had time to practice prior to performing the exercise test. HR was monitored between 50 and 70% of their predicted maximal HR, and this was considered moderate intensity aerobic exercise. During the last 15 seconds of each stage the RPE and HR were recorded. RPE was reported by the participant pointing to a number on the scale and researchers validated responses by asking

probing questions, such as, 'Do you feel this task is easy?' or 'Do you feel this task is a little difficult now?' The test was stopped if participant's HR reached above 85% of predicted maxHR, the entire protocol was completed, or he or she indicated that he/she was too tired and/or did not want to continue. This study indicated that persons with DS can perceive physical exertion and report an accurate subjective estimation during walking. There was a positive linear relationship for mean RPE versus mean HR values for all participants at each stage during the duration of walking. However, the results of the individual regression analyses are variable. They conclude that the four-point scale is a useful tool for this population as it is simple and eliminates extra information processing time for individuals with DS (Chen, Ringenbach, Snow, & Hunt, 2013).

Sport-Skill Assessment

Our current educational system requires that assessments be used to comply with standards-based education and accountability. The National Association for Sport and Physical Education (NASPE) has been a leader in this area of standards-based education and assessments as they recognize that physically educated individuals will have the knowledge, skills, and confidence that they need to enjoy a lifetime of physical activity (NASPE, 2011). An example of the NASPE standards is, "Standard 1: demonstrates competency in motor skills and movement patters needed to perform a variety of physical activity" and is of interest to this project. The PE Metrics assessments developed by NASPE can be used by a plethora of individuals from teachers, schools, administrators, policymakers, and researchers as it provides a solid foundation for measurement, data collection, and accountability (NASPE, 2011). The PE Metrics assessments are subjective ratings scales that use absolute ratings. The skills are rated based on personal observations by the observer and are based on a fixed scale of predetermined standards

of performance, in rubric form (Morrow, Mood, Disch, & Kang, 2016). In all aspects of recreation and education, sport skill assessments have become very popular as the data obtained can potentially eliminate the need for longitudinal data on an individual. Minimally, test-retest, methodology, validity, feasibility and limitations should be addressed in sport skill assessment outcomes (Robertson, Burnett, & Cochrane, 2014).

Student Perceptions Surrounding PA

Barr and Shields (2011) conducted 18 interviews with 20 parents (16 mothers and 4 fathers) of children with Down syndrome (2-17yrs) in order to identify and examine barriers and facilitators to their child's participation in PA. Their study highlighted the importance of supporting and encouraging families with a child with DS to have them participate in PA as they found four key themes on facilitators to PA: positive role of the family, opportunities for social interaction with peers, structured accessible programs that make adaptations for children with DS, and children who were determined to succeed and who were physically skilled. On the other hand, four themes on barriers to PA included: characteristics commonly associated with DS, competing family responsibilities, reduced physical or behavioral skills, and lack of accessible programs. Ensuring social interactions with their peers and encouraging positive PA experiences using particular skills can be especially beneficial to children engaging in PA.

Self-efficacy is as byproduct of knowledge and is essentially the, "perception of one's ability to successfully perform a particular behavior" (Block, Taliaferro, Harris, & Krause, 2010). Self-efficacy beliefs can affect one's behavior and what they do with the knowledge and skills that they possess (Bandura, 2006). These beliefs in ones' self, coupled with positive support from parents and teachers can lead to autonomous motivation and positive attitudes towards physical activity (Vierling, Standage, & Treasure, 2007). For children, participation in

physical activity is often motivated by these feelings of self-efficacy. Trost et al., (1997) found that participation in community sports and self-efficacy in overcoming barriers were significant predictors in participation of physical activity across 202 rural, predominantly African-American children. Additionally, children with disabilities who are often times less motivated to participate in physical activity, are more likely to be active if they have social support from peers, and if they believe that they will be successful (Kodish, Hodges-Kulinna, Martin, Pangrazi, & Darst, 2006). These feelings of self-efficacy translate into adulthood as there is a linear relationship between behavioral and cognitive processes change and self-efficacy (Kosma, Gardner, Cardninal, Bauer, McCubbin, 2006). Stanish et al., (2016) found that youth with ID when compared to typically developing youth, reported more often that they didn't have someone else to do physical activity with, that they believed physical activities were too hard to learn and that they disliked individual physical activities. These beliefs likely lead to decreased physical activity levels in youth with disabilities.

Summary

Despite withstanding laws, such as IDEA and the ADA, and trends in legislation that protect individuals with disabilities from discrimination and that increase access to public facilities and programs, the research has shown that physical activity levels among children and adolescents with disabilities are considerably lower than children and adolescents without disabilities. Because adolescents with disabilities will be transitioning from school life to community living, increasing physical activity levels, social and recreational inclusion and involvement, as well as learning skills needed to initiate and maintain active and healthy lifestyles is of utmost importance.

Unfortunately, there is a lack of organized, inclusive, interscholastic athletic programs and as such there is insufficient evidence that these programs promote and provide fitness, health, and social related outcomes. Community based sports programs such as Special Olympics' Unified Sports has been proven to be successful in promoting social inclusion and positive attitudinal changes towards individuals with disabilities. Additionally, these programs provide a much-needed structured environment that helps to promote sport-skills needed to participate in recreational activities. Inclusive curriculums such as the SPARK curriculum have successfully increase physical activity while promoting sport skill, cognitive understanding, and fitness. Having such skills can lead to greater feelings of self-efficacy which is a determinant for physical activity participation into adulthood.

Participation in recreational sports programs can be a terrific avenue for all individuals to increase their daily MVPA. However, what is MVPA? Still remains a question to many people. MVPA can be defined, practically as 70-85% of one's estimated maximal heart rate. Yes, monitoring exercise intensity for individuals with disabilities, outside a laboratory setting has yet to be fully investigated. The use of commercially available heart rate monitors and the further understanding of the practicality and usefulness of a modified RPE scale to assess one's exercise intensity can lead to achieving MVPA which in turn can lead to increased health and fitness. With the increase in the inclusive movement, physical activity interventions targeting an increase in moderate to vigorous physical activity, cognitive understanding of ratings of perceived exertion, and sport-skill based social interactions is warranted for high school students with special needs.

Chapter III

Method

This chapter describes the methods used to study the effects of the intervention on the special needs student's heart rate, RPE comprehension, fitness, and skill acquisition. The chapter includes the following sections: participants, setting, description of the independent variable, definition and measurement of the dependent variables, treatment integrity and reliability, experimental design, procedures, social validity, and data analysis.

Participants

A convenient sample of fourteen adolescents (2 females, 12 males) attending an East High School in Hawaii were initially included. Participants targeted were those students with special needs (who are on a non-diploma track). Participants were asked if they would like to participate in an interscholastic basketball program's fitness and sport-skill assessments. Teachers recruited the potential participants and health screenings were done by the individual's doctors and athletic trainers similar to how any other student would be cleared to participate in any interscholastic sport. As such, informational consent and assent forms were given to the school and passed out by the special education teachers. No physical activity restrictions were placed on participants during this study. Due to absenteeism (travel, field trip, or illness), nine participants' data were withdrawn from analysis. As a result, five participants (5 males) completed at least 90% of the lessons and participated in all of the data collection phases (training, 3 intervention phases, and pre- and post-fitness and skills assessments). All five participants were the same age at pre- and post-testing.

All potential participants returned signed parental consent and student assent forms. Approval from the University of Hawaii Internal Review Board, Hawaii Department of

Education, school principal, and cooperating teachers were obtained before data collection (See Appendix A).

A description of each participant's disability was determined through available records. No names were used throughout the study and data collection to safeguard the privacy of each participant. Detail information and demographics of participants are reported in Table 3.1.

Table 3.1

Participants' Demographic Information

Participant	Gender	Age	Disability Classification	Height (ft'in")	Weight (lbs)	BMI	Ethnicity
1	Male	14	ASD	5'5"	146	24.1	Asian
2	Male	16	ID	5'7"	184	28.8	Native Hawaiian or other Pacific Islander
3	Male	20	ID	5'8"	198	30.1	Native Hawaiian or other Pacific Islander
4	Male	15	ED	5'10"	200.5	28.8	Two or more races
5	Male	15	ID	5'8"	112.5	17.1	White

Setting

The training, pre-testing, intervention, and post-testing was carried out at same high school throughout the program. The program was delivered during school hours in the adapted physical education classroom. The high school gymnasium and outdoor basketball courts were the two facilities that were primarily used throughout the program but the classroom and weight room were both utilized on rain days as an alternate facility. Throughout the program delivery the usual Physical Education teacher, two teaching assistants, four educational assistants, and two skills trainers were present during each session.

Participants were asked to wear comfortable athletic clothing and covered, preferably, athletic shoes. Wrist-worn heart rate (HR) monitors were utilized to monitor heart rate

throughout the exercise. These, commercially available, Garmin Vivosmart HR, heart rate monitors will be used to monitor HR and facilitate exercise between a specific HR range in order to achieve moderate (50-69%) to MVPA (70-85% of maximal HR) throughout the majority of the class, with the maxHR equation 220-age= maxHR (Center for Disease Control and Prevention, 2015). The FitnessGram one-mile run/walk test and the PE Metrics Basketball Skills Assessment Rubrics were used to assess aerobic fitness and sport-skill outcomes.

Post-intervention surveys (See Appendix F) measured participant perceptions as well as parent and teacher/coach perceptions of the participant were given to the appropriate parties by the head coach of the team. The purpose of obtaining information from coaches and parents is to assess social validity.

Independent Variable

The independent variable was a 10-week interscholastic athletic program intervention that includes three changing criterion phases (Phase 1 – skill and drill, Phase 2 – mostly scrimmages and modified game play, Phase 3 – Combination of Phase 1 and Phase 2), and time (pre- vs. post-intervention). The range-bound intervention, using the SPARK – After School Active Recreation, "Super Sports" curriculum was modified and followed using these similar guidelines to:

1. Week one to three the participants will participate within the range-bound intervention of 50-60% of his/her maximum heart rate (lower end of moderate PA). Phase 1 activities will include a ten-minute warm-up, followed by 30 minutes of skill development: Week one activities will include ready position/footwork/agility skills, ball handling, and dribbling skills. Week two activities will include passing and catching. Week three activities will include shooting and rebounding. All activities

will not come from the SPARK "Super Sports" curriculum but rather skill and drill type practice activities.

2. Week four to six the participants will participate within the range-bound intervention of 60-70% of his/her maximum heart rate (upper end of moderate PA). Phase 2 activities will include a ten-minute warm-up, followed by 30 minutes of modified game-play for three weeks. All activities will come from the SPARK "Super Sports" curriculum.
3. Week seven to ten the participants will participate within the range-bound intervention of 70-85% of his/her maximum heart rate (MVPA). Phase 3 activities will include a ten-minute warm up, followed by 20 minutes of skill development and 10 minutes of modified game-play. During this phase skill development drills will include more "game-like" situations: Week 1 will introduce including a defender, Week 2 will include combining skills, and Week 3 will include offensive and defensive positioning. All activities will come from the SPARK "Super Sports" curriculum.

Additionally, all lesson plans will be kept (see Appendix D).

Dependent Variables

There were a number of dependent variables in this study. In the single subject changing criterion design, the dependent variables of interest are HR, RPE, and whether or not participants can accurately report RPE using a modified RPE scale (correlation coefficient). Garmin Vivosmart HR, HR monitors, were used to measure activity HR for participants while the RPE was used exclusively by participants to describe their individual rate of perceived exertion for the activity. Additional dependent measures in the quasi-experimental design are aerobic fitness

outcomes (change in one mile run/walk time) and basketball ball skill outcomes (PE metric rubric scores).

Reliability and Treatment Integrity

Interobserver Agreement. The observational nature of single subject research required accurate independent variable measurement as well as clear and concise operational definition of the dependent variable to increase the likelihood of reliable data collection. To remedy, interobserver agreement (IOA) from one trained observer (with expertise in adapted physical education) was utilized in this study. IOA refers to the percentage of agreement between independent observers across specific observational segments (Horner et al., 2005). Cooper et al. (2007) advised IOA should be collected during each phase of the study with observed segments distributed across a schedule representative of all data collected in the study. As well, the percentage of obtained IOA should fall between 25% and 33% of all sessions in the study; a parameter set forth by the current practices in behavioral research.

To calculate the percentage of obtained IOA, I implemented a trial-by-trial IOA percentage of dependent measures by taking the number (#) of item agreements divided by the total number of items and then multiplying that figure by 100. The trial-by-trial IOA percentage will be:

$$\frac{\text{Agreements}}{\text{Total number of items}} \times 100 = \%\ \text{Agreements}$$

I collected IOA data during both baseline and intervention phases along the sequence of every third class, including the first baseline phase and last intervention phase practice. To provide a representative depiction of all collected data, IOA data were collected following the sequence of every third class because student participant schedules vary each week.

Obtaining valid IOA data also required observers to adhere to three specific criteria: (a) use the same measurement system, (b) measure the same events, and (c) observations are conducted independently (Cooper, et al., 2007). A training session was conducted during the first week of this study to ensure the observers use the same measurement system to produce IOA data. Specifically, a one hour observer training involved explanation and overview of the study procedures and assessments used.

In addition to observer qualification as an adapted physical educator, the observer will participate in one additional training session during the 6th week of this study, to reduce the likelihood of observer drift. Observer drift is observers sometimes unknowingly sway from accurate observation procedures, thus generating threats to a study's reliability (Cooper, et al., 2007). As such, I will conduct a secondary re-training half-way through the study to address observer drift and provided responses to all observation-related questions. I will provide the observer with clarification throughout the study in the event that questions arise. A pre-established 80% IOA criterion level will be set to consider observed data as reliable. Consequently, I will keep the trained observer naïve to investigator scoring of student performance and expected outcomes of the study to ensure observer scoring remains independent and not influenced by other measurements.

Treatment Integrity. Cooper et al. (2007) defined treatment drift as an occurrence where the independent variable is administered unequally throughout the study. To counter this, a second trained observer will assist with data collection and the scoring of the coach/teacher's ability to perform the procedures outlined during coach/training, using a treatment integrity checklist (See Appendix E). Identical training to those used for IOA will be given to the second observer. Similar to the observation ratings checklist, the observer will be graded on procedural

criteria using a Y/N rating system (Y= satisfies criteria; N= does not satisfy criteria). A pre-established 90% treatment integrity compliance criterion level was set to consider observed data as reliable.

Interrater reliability. Interrater reliability was determined for scoring on the PE Metric Basketball Skills rubrics. Two trained assessors scored each student using the rubric. During pre- and post-assessments, interrater reliability between the two assessors were to exceed 95%. No other objective measure was used to assess basketball skills to eliminate participant burden of multiple testing days. Additionally, for this population, assessment in a real-life setting is important for recreational life beyond the school setting.

Procedural Integrity. In order to maximize reliability of RPE reporting by the students, the instructor gave verbal and visual instruction reminders (using chart) for use of the RPE scale. These reminders were given on the first day of each intervention stage (days 1, 8, and 14) as well as on the day that the students returned to class from spring break (day 19). Reminders outlined the physical and physiological feelings that might be associated with the change in scale points.

Experimental Design

This study was designed in three parts: First, a single subject range-bound changing criterion design across subjects (Cooper, Heron, & Heward, 2007) was utilized to examine HR and RPE throughout the baseline and intervention phases of the program. Second, a repeated measures quasi experimental design (Thomas, Nelson, & Silverman, 2012) assessed fitness, sport-skill, and participant perception outcomes before and after a 10-week intramural program. Third, an evaluation of social validity and perceptual outcomes of the program by participants, staff and parents.

Single Subject Range Bound Changing Criterion Design. With respect to the range bound changing criterion design, three intervention phases which includes skill-based learning, modified game play, and combination- skill and modified game play stages make up the 10-week interscholastic athletic program, that culminates in an intramural basketball game against another high school team with a similar make-up. McDougall (2005) explains that a range-bound changing direction design is a variation of the classic changing direction design where it includes both a lower and upper criterion in each intervention phase. The range-bound changing criterion design will gradually increase exercise intensity and promote reasonable increases in exercise intensity. This study will use maximum exercise intensity set as the upper or ceiling value, and the lower limit will be set to the lowest exercise intensity to be expected from participation in physical activity within each stage. The upper limit should reduce the likelihood of injuries due to exercising at an intensity too high and not being able to make it through the whole practice while, the lower limit established the floor for the intensity that the participant should reach while participation in the sessions.

Quasi Experimental Research Design. The quasi experimental design will also be used to analyze pre-test and post-post-test scores for the following measures: 1. FITNESSGRAM testing and 2. PE Metrics testing.

Pre-testing. For the introduction day, participants will be asked to wear comfortable clothing and covered, preferably athletic, shoes. They will undergo

1. *Anthropometrics.* Height and weight will be measured upon arrival. Height will be measured to the nearest 0.1 cm, using a wall mounted stadiometer. Participants' height will be taken while barefoot. Body weight will then be measured using a calibrated scale with participants' clothes on but shoes off. Values will be recorded and Body Mass Index (BMI) will

be calculated using: body mass (kg) divided by height in (m) squared. Age-sex specific BMI percentiles will be used to classify youth into three categories: healthy (<85th percentile), over-weight (>85th and <95th percentiles), and obese (>95th percentile) according to CDC growth charts (NCHS, 2011).

2. *FITNESSGRAM.* The FITNESSGRAM is a test that is widely used to measure physical fitness levels in schools across the nation. The tests measured aerobic capacity and body composition (Protocols from http://www.ccsoh.us/Downloads/FG%20Test%20Administration%20Manual%20Updated%204E.pdf).

a. Estimates of aerobic capacity are expressed as VO_2 max in ml·kg–1·min–1, regardless of what assessment was used. The VO_2 max was estimated from equations developed specifically for the PACER or one-mile run/walk. The one-mile run/walk test was used for this study as it requires very little instrumentation and can be readily understood and used in life beyond school or formal settings as it aligns with goals related to these students' individualized transition plans (ITP) (Jansma, 1999). Participants were asked to complete (run or walk) four laps around the high school track as fast as they can. Their time to complete the task will be used to estimate their aerobic capacity.

3. *PE Metrics.* PE Metrics are reliable standards-based assessment and rubrics to measure student achievement of the National Standards by high school graduation and appropriate progress (NASPE, p. 3).

a. Basketball ball skills, offensive play, and individual defensive play were assessed using the PE Metrics rubric. There are five levels (0-4) of competency in

the rubric. 0 being the lowest level and 4 being the highest level of skill competency. Ball skills were assessed in modified game play. The rubric is found in the PE Metrics: Assessing National Standards 1-6 in Secondary School book. Two researchers were present and score each participant individually. Interrater reliability scores should exceed 90% based on pilot trials using videos available, online.

Procedures

Once IRB approval was granted, students who were identified by school staff as those who are on a non-diploma track, who are at-risk, and who are eligible otherwise were recruited by teachers at the high school. Parental consent forms and child assent forms that contained additional information, were distributed by the teachers and were collected prior to participation in the program.

Training for Students. Prior to distributing the heart rate monitors to participants, each unit was initialized and set-up using the online software and instructions provided by Garmin. Each student was assigned a monitor that was tagged with a code number. The same heart rate monitor was distributed to each student by the researcher and teaching assistant at the beginning of each class. At the end of each class, the students lined up and returned the heart rate monitors. Students were informed on how to properly use the heart rate monitors and how they should fit. If the monitor was too tight or too loose they were to let the teacher or researcher know. A few of the students knew how to put the device on and part of their education is to learn how to do tasks of everyday living on their own so they were allowed to put their own watch on. Once they were satisfied with the fit, the researcher or teacher checked the fit to make sure it was worn properly.

The training consisted of six sessions that spanned three weeks. The first two sessions were classroom sessions where the students were introduced to the heart rate monitors and they practiced operating the device, especially getting to the HR screen, and getting used to the fit and wearing it. Training sessions 3 through 6 were held in the school gym. Each day, the students lined up to receive their heart rate monitor. After receiving their heart rate monitor the students received verbal descriptions of the four RPE stages that coincided with the picture diagram and verbal instruction on how to report their RPE score was given. The teacher then went around the class to check for understanding of the stages by asking questions such as, "What does one mean?", "If you are exercising so hard that you want to stop, what level are you at?", and "When it gets harder to catch your breath and you feel your heart beating faster is the level increasing or decreasing?", etc.

When reporting the RPE scores, students were asked, "How did you feel during that activity?". The student would then point to a number (or picture on the diagram) and if they could, they were asked to say the number as well.

Students then went through their routine warmup before going through training activities. The training activities included a systematic build up from walking, to speed walking, to jogging, to running. Training activities varied by use of obstacle courses to maintain interest and variety throughout the sessions. After each activity, the students were allowed to see their heart rate and report a score to the trained data collectors. During training the data collectors were able to give additional cues such as asking questions regarding heart rate, breathing, heaviness of legs, etc. if the student was unsure about their response.

The training sessions also served a secondary purpose. The teacher noted that some of the students in the class had trouble with new routines. So, during training, we established the new

routine that included receiving (and wearing) the heart rate monitor and reporting scores after each activity. The class was broken down into four parts: warm-up, activity 1, activity 2, and activity 3. The heart rates and RPE scores were collected within the last minute following the warmup or activity.

Pre-Testing. Following the completion of RPE training sessions the students were instructed to wear comfortable clothing and athletic shoes to participate in the one-mile run/walk testing the following class period. Prior to walking out to the track, student's height and weight were taken in the classroom, with clothes and shoes on and a male and female researcher present. Students were asked to give their best effort but to practice the "pacing" that they had practiced and discussed in the previous semester. The stopwatch was started when the teacher said, "Go". The teacher, educational assistants, and researcher counted laps for students and when each student completed the mile distance the teacher read off the time out loud so that the researcher could write it down.

The following class period, the students completed the warm-up, were allowed 10 minutes for free practice on the basketball courts, and then participated in two 10-minute modified game periods (4 versus 4, half court games). Two trained assessors each scored the students using the PE metrics scale and compared scores. In only two cases assessors were off by one point and those two were reassessed the following class period until agreement was formed.

Intervention. Sessions were held during their regular adapted physical education class. Stage 1 (skill-based learning) spanned three weeks and seven sessions, stage 2 (modified game play) spanned three weeks and six sessions, and stage 3 (combination- skill and modified game play) spanned four weeks and ten sessions. During each stage the classes followed the same format but the activities varied. Stage 1 activities were to be only skill and drill type practice.

The stage 2 activities were only modified games. Stage 3 activities were to be two-thirds skill and drill, followed by one-third modified game play activities. The teacher provided lesson plans for each session.

Post-testing. Following the last day of intervention activity, the students were instructed to wear comfortable clothing and athletic shoes to participate in the one-mile run/walk testing the following class period. Prior to the timed one-mile run/walk, the students were asked to give their best effort but, to again, practice "pacing". The stopwatch was started when the teacher said, "Go" and laps were counted for students. When each student completed the mile distance the teacher read off the time out loud so that the researcher could write it down.

The following class period, the students completed the warm-up, were allowed 10 minutes for free practice on the basketball courts, and then participated in two 10-minute modified game periods (4 versus 4, half court games). Two trained assessors each scored the students using the PE metrics scale.

Social Validity

Social validity in behavioral research should assess, "The social significance of the target behavior, the appropriateness of the procedures, and the social importance of the results" (Cooper et al., 2007, p. 238). In order to assess the intervention, procedures used, and social significance of the study's results including perceptual outcomes, we administered post-participation surveys that will be given to the participants (students) and teachers/coaches following the last game. The surveys were distributed by participating coaches and will be collected by the coach by a predetermined date (one week following the completion of the last game) or by online submission (due one week following the last game).

The surveys used were from Team Prime Time and have been designed and validated by the company. Institutional data will not be used. (See Appendix F)

To ensure confidentiality, each participant was given a code number to ensure privacy, no matter the mode of response. Only the researchers (Allison Tsuchida, Dr. Nathan Murata, and Jim Barry) knew participants' name and code number. All researchers have completed the human subjects training. These codes were kept in a locked file in the KRS offices. Electronic devices that may have access to online survey responses were locked at all times by a passcode. No identifying information was kept on the data collection sheets. Participants were coded prior to the data collection and the coding sheet will be kept in a separate file. All identifying data will be destroyed at the conclusion of the research study.

Data Analysis

Single Subject Range Bound Changing Criterion. Collected data, comprised of multiple data points recorded for each student, were plotted onto a line graph. Visual inspection of graphed data was used, as well as descriptive statistics, to analyze data from the three intervention stages for HR and RPE. Heart rate was evaluated through visual analysis of graphical records (Cooper et al., 2007). The three intervention phases were compared. Additionally, mean scores and the percentage of conforming data (PCD) index was calculated as recommended when using the RBCC design (McDougall, 2005). The PCD is an index to supplement visual analysis when evaluating the effects of an intervention (McDougall et al., 2005). It is calculated by adding the number of data points within intervention phases that fall within criterion ranges for respective intervention phases, divided by the total number of data points within all range-bound intervention phases and then multiplied by 100 (McDougall, 2005; McDougall et al., 2005). Additionally, the following descriptive statistics were calculated:

central tendency (means), measures of dispersion (standard deviations and range), and N (number of sessions).

Repeated measures quasi-experimental design. Descriptive data were summarized and examined for violations of normality and outliers. SPSS statistical analysis tool will be used to determine if differences exist between pre- and post-testing data. Specifically, a Wilcoxon Signed-Ranks Test was used with a 95% level of confidence. Furthermore, a chi-square test of goodness-of-fit was performed to determine if any differences existed between intervention stages with a 95% level of confidence.

Chapter IV

Results

The purpose of this study was to examine the fitness, sport-skill, and perceptual outcomes of a 10-week basketball program for students with disabilities. This chapter presents the results of the effects of the intervention (basketball skill, modified game and combination skill and game) on heart rate, RPE, and outcomes of aerobic fitness and sport-skill from an interscholastic basketball program for students with special needs. In the first section of this chapter, treatment integrity and interrater reliability results are reported. In the second section, data for all participants are presented followed by the results from the social validity questionnaires. The last section of this chapter provides a summary of the results.

Treatment Integrity and Reliability

Table 4.1 summarizes the treatment integrity scores for all sessions during program implementation. Treatment integrity was established by the use of a checklist (Appendix E). Two independent observers were trained to view the following: introduction the lesson, RPE recalibration information if appropriate (specified days), lesson plan adherence to intervention stage, adherence to lesson plan, and consistent time frame for data recording and observations and recording required a minimum of 80% interrater reliability scores. Upon completion of the training, independent observers met the 80% a priori score for interrater reliability. During intervention phase, two independent observers were used to ensure the intervention was applied as intended and in a consistent manner. Across a random sample of seven sessions: 2, 5, 8, 12, 14, 19, and 21 (representing 30% of the total sessions), observers recorded intervention and confirmed that it was applied in a consistent manner for each observed session. The observers coded each session and IOA was calculated with a priori criterion set at 90%. The overall mean

score among observers and the researcher for all selected sessions was 97% which was above the target IOA percentage. Based on the obtained mean scores across randomly selected sessions, treatment integrity was found to be acceptable.

Table 4.1

Treatment Integrity via Interobserver Agreements

Session	Observer 1 Checklist	Observer 2 Checklist	IOA
2	100%	100%	100%
5	100%	100%	100%
8	80%	100%	80%
12	100%	100%	100%
14	100%	100%	100%
19	100%	100%	100%
21	100%	100%	100%
Total Mean	97%	100%	97%

Interrater reliability was determined for scoring on the PE Metric Basketball Skills rubric. Two trained assessors scored each student over the period of two sessions using the assessment rubric. Following the assessments, the assessors compared individual PE Metric rubric scores for each student. During pre- and post-assessment, interrater reliability between the two assessors exceeded 95%.

Intervention Behavior

Heart Rate. Data in Figures 4.1 through 4.5 and Tables 4.2 through 4.6 indicate that HR increased throughout the intervention phases for all participants during the implementation of the intervention stages, while outlying data points were present.

Participant 1. Participant 1 is a 14-year-old, male student with ASD. He is on a non-diploma track and has a skills trainer that is with him daily. The skills trainer for this student takes a very hands off approach during the adapted PE class and did not have any interactions with the student during the class periods observed. Participant 1 is a quiet student who always participates in on-task behavior.

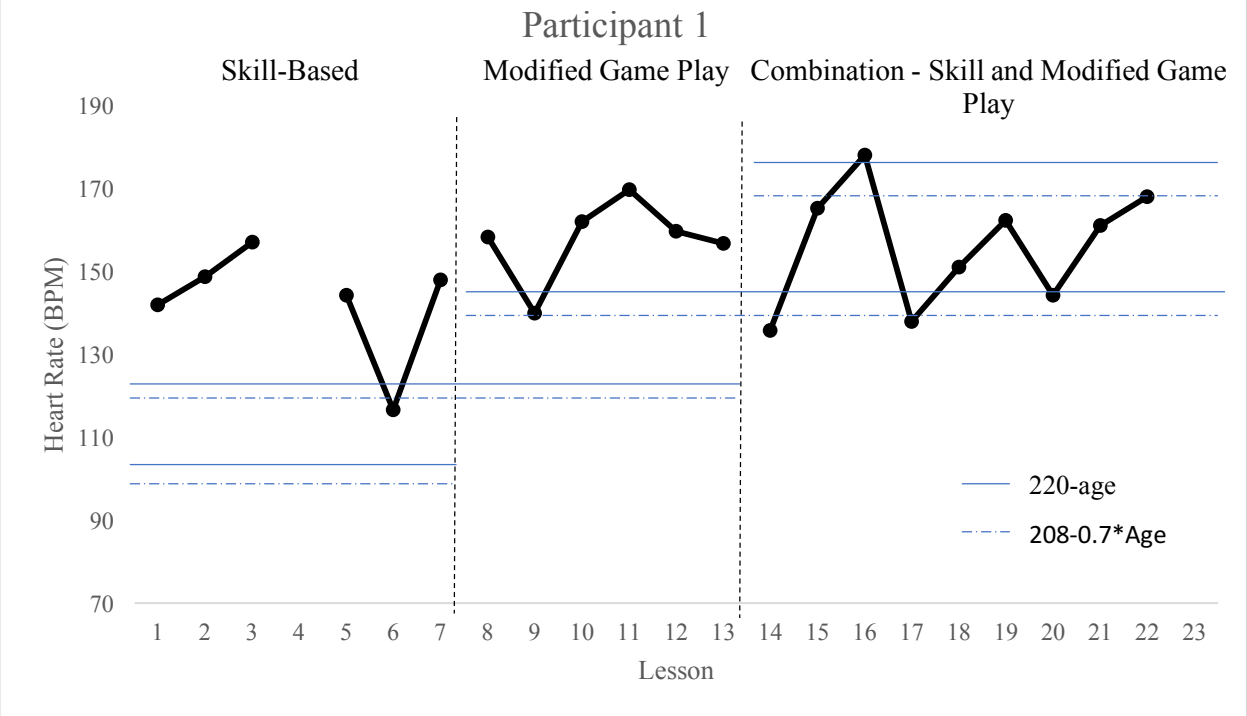

Figure 4.1: Changing Criterion Average HR (bpm) for Participant 1 Using the Age Estimated Maximal HR Equation (220-Age) and the Age-Predicted Maximal HR Equation (208-0.7*Age).

Table 4.2

Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 1 Using the Age Estimated Maximal HR Equation (220-Age).

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	102.00-122.40	112.20	116.70-157.00	142.80	1/6=17%
Intervention Stage 2	122.40-142.80	132.60	140.00-169.70	157.70	1/6=17%
Intervention Stage 3	142.80-173.40	158.10	135.70-178.00	156.00	6/9=67%

Table 4.3

*Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 1 Using the Age-Predicted Maximal HR Equation (208-0.7*Age).*

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	99.10-118.92	109.01	116.70-157.00	142.80	1/6=17%
Intervention Stage 2	118.92-138.74	128.83	140.00-169.70	157.70	0/6=00%
Intervention Stage 3	138.74-168.47	153.61	135.70-178.00	156.00	6/9=67%

Graphic display of data path during skill-based intervention (stage 1), show that participant 1 consistently reached heart rate levels that were above the lower bound for the lower end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 103-124 bpm with a mean of 113.5 bpm, while the actual performance mean of 142.8 bpm was observed. Participant 1 demonstrated increased average heart rate of 142 bpm on day 1 and gradually increased to 157 bpm by day 3. During stage 1, he was sick on day 4 and therefore missed that lesson, however, only one point fell within the range bound criteria thus resulting in a percentage of conforming data (PCD) of 17%, (one out of six data points resided within the range bound criteria). Closer examination of each respective lesson plan found that stage 1 intervention emphasized more skill drill practice type activities that may have influenced

participant's 1 heart rate. In fact, during lesson 6, participant stood around with minimal movement for longer periods of time due to lines and activities involved. For instance, during this lesson, participants stood in a line of at least four students during the dribbling practice and passing review. During the third segment of that lesson, the teacher introduced shooting which increased knowledge and transition times as the students took set shots from different markers around the basket. Within phase criterion scores for stage 1 ranged from 103.5-124.49 bpm, $\overline{X}$=113.5 bpm, suggesting that participant 1 exerted physical activity levels above the criterion score (actual within phase range 116.7-157 bpm, $\overline{X}$=142.8 bpm). Consequently, this connotes that he was exerting high levels of physical activity in the skill-based learning stage (See Table 4.2). Participant 1 was also very excited to start the basketball program which may have led to higher exertion levels at least during stage 1 and not necessarily directly attributed to the skill based lessons.

Visual inspection of data paths during modified game play intervention (stage 2) indicates upward trend line with variability on day 9. Participant 1 consistently reached heart rate levels that were above the lower bound for the higher end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 124-144 bpm with a mean of 134 bpm while an actual performance mean of 157.7 bpm was observed. Participant 1 had an average heart rate of 158 on day 8 and dropped to 140 bpm on day 9 before resuming the upward trend on day 10 at 162 bpm. Consequently, again, only one out of six data points (17%) were within the range bound criteria while all other data points fell above the criterion. The variability between days 8 and 9 might be attributed to the teacher introducing a new modified game called "trashcan ball" to promote passing on day 9 which potentially played a role in the participant's lower average heart rate for the day (140 bpm). This game also added in the tactical concept of

getting open to receive a pass as well as defensive positioning. On day 10, the students seemed to get a hang of the game and it was more interactive and they visibly enjoyed the activity, potentially resulting in the increased average heart rate of 162 bpm. In the following class sessions, they moved on to different modified games that emphasized dribbling and shooting, which were more individualized activities and where essentially, the students were able to work at their own pace. A more detailed look at lesson 13's lesson plan found that the teacher reintroduced the passing component to two parts of the lesson, which may have led to the slight decline in exertion as the athletic abilities of the class vary widely. Within phase criterion scores ranged from 124.5-144.49 bpm, $\overline{X}$=134 bpm which was exceeded by participant 1's actual physical activity exertion levels that were above criterion scores (actual within phase range 140-169.7 bpm, $\overline{X}$=157.7). This implies that participant 1 was more active in the modified game play activities during intervention stage 2. In stage 2, again, only one out of six data points (17%) were within the range bound criteria while all other data points fell above the criterion. Figure 4.1 provides graphic display of nonconforming data points in stages 1 (skill-based) and 2 (modified game play) of intervention demonstrated a positive trend in which data points exceeded the maximum bpm level for the range bound criteria.

Visual inspection of data path for the combination – skill and modified game play intervention (stage 3) indicated a stable state responding with variability of four data points falling outside the range-bound criteria (days 14, 16, 17, 20). The within phase criteria mean HR and the actual performance mean HR were within 3.5 bpm from each other, 159.5 bpm and 156 bpm respectively. Yet, visual inspection of trend indicates the most of the data points fell within the range-bound criterion during this stage. Specifically, the range bound criterion was 144-175 bpm. Participant 1 demonstrated an average heart rate of 145 bpm on day 14 and increased to

178 bpm by day 16 before dropping back to 138 bpm on day 17. Average heart rate then increases to 162 bpm on day 19 and dropping again to 144 bpm on day 20 before again increasing to 168 on day 22. Participant 1 was absent from class on day 23. This peak and valley pattern can be visually observed in Figure 4.1. Participant 1 only achieved established criteria that represented MVPA consistently during stage 3 of intervention where he reached a PCD of 56% (five out of nine points resided within the range bound criteria). Upon further review of the lesson plans during stage 3, all lessons included a combination of dribbling and passing or dribbling and shooting as the skill-based learning component leading up to modified game play. On days 14, 17, and 20 where the data points fell below the criterion level, the dribbling and passing skill-based combination (part of previous stages) was used. This type of scaffolding of activities within lessons is done typically during physical education classes. While the focus of stage 3 was a combination of skills and modified games, warm-ups, passing and dribbling skills are still common to these lessons. Consequently, this may imply that the need to work at a pace that is influenced by a partner or team may have lowered physical activity intensity levels. Within phase criterion scores for stage 3 ranged from 144.5-175.49, $\overline{X}$=159.5 while the actual within phase range was 135.7-178 bpm, $\overline{X}$=156, connoting that in this stage, participant 1's physical activity exertion levels were within the criteria. Graphic display of nonconforming data points in stage 3 (combination of skill and modified game play) of intervention demonstrated that the three out of the four nonconforming data points that fell below criterion levels were trending in the positive direction to almost meet criterion levels. This may indicate that a learning curve on how to work with others and cognitively apply passing concepts could have been a factor in activity levels on those days.

Furthermore, when using the age-predicted maximal HR equation (208-0.7*Age), by Tanaka et al. (2001), graphic display of the data shows that only during stage 2, do we find a lower PCD (0%) compared to 16% using the traditional 220-age formula. Additionally, by using the age-predicted formula, the actual within phase mean ($\overline{X}$=156) during stage 3 was then higher than the within phase criterion ($\overline{X}$=153.61) resulting in all of the three actual within phase means falling above the criterion mean levels.

Participant 2. Participant 2 is a 16-year-old, male student with ID. He is on a non-diploma track and does not have a skills trainer. This student always participated with a positive outlook, encourages others, and does not shy away from working with anyone in class. He was very friendly and enjoys talking to his friends before, during, and after class.

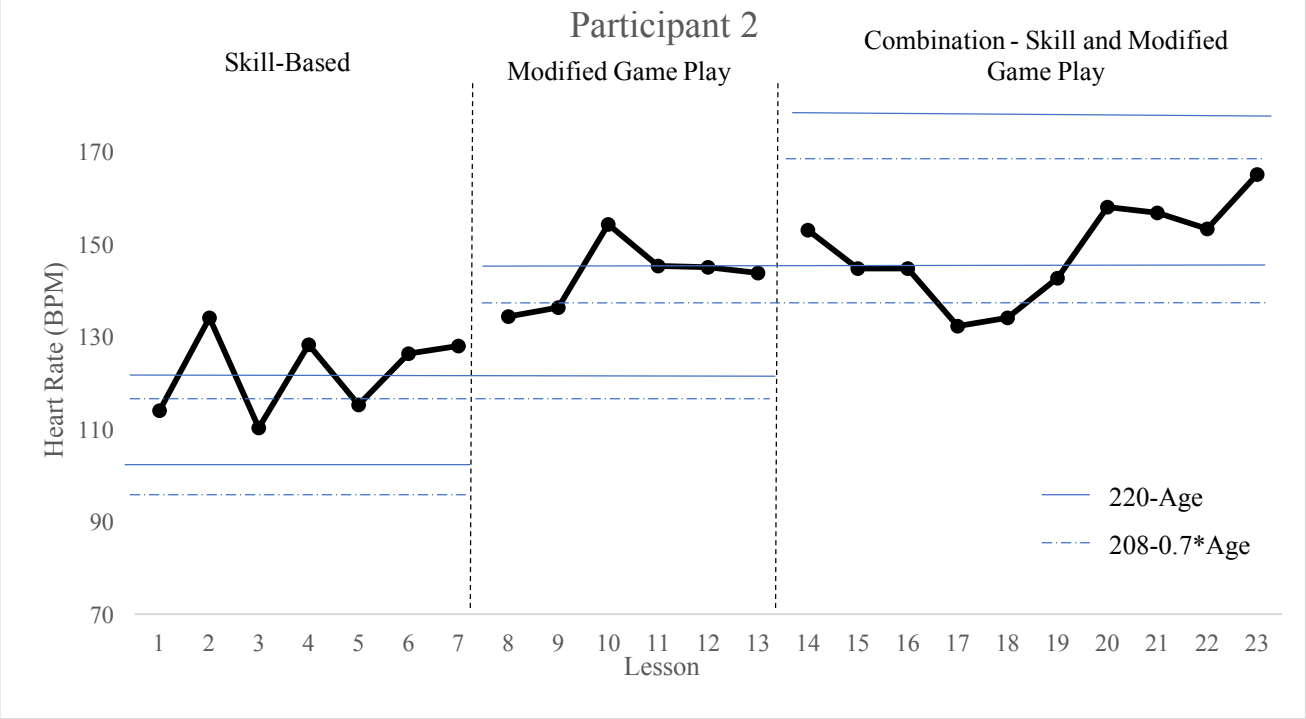

Figure 4.3: Changing Criterion Average HR (bpm) for Participant 2 Using the Age Estimated Maximal HR Equation (220-Age) and the Age-Predicted Maximal HR Equation (208-0.7*Age).

Table 4.4

Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 2 Using the Age Estimated Maximal HR Equation (220-Age).

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	102.00-122.40	112.20	110.30-134.00	122.30	3/7=43%
Intervention Stage 2	122.40-142.80	132.60	134.30-154.30	143.20	2/6=33%
Intervention Stage 3	142.80-173.40	158.10	132.30-165.00	148.40	7/10=70%

Table 4.5

*Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 2 Using the Age-Predicted Maximal HR Equation (208-0.7*Age).*

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	98.40-118.08	108.24	110.30-134.00	122.33	3/7=43%
Intervention Stage 2	118.08-137.76	127.92	134.30-154.30	143.20	2/6=33%
Intervention Stage 3	137.76-167.28	152.52	132.30-165.30	148.40	8/10=80%

Visual inspection of data path during skill-based intervention (stage 1), indicated a stable state responding with variability of four data points falling outside the range-bound criteria (days 2, 4, 6, 7), resulting in PCD=43% (four out of seven data points resided within the range bound criteria). Thus, participant 2 consistently achieved heart rate levels that were at or above the lower end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 102-122 bpm and mean of 112 bpm, while actual performance mean was 122 bpm. As previously mentioned, stage 1 intervention emphasized skill drill practice type activities that may have influenced participant 2's heart rate. Upon closer examination of the lesson plans throughout stage 1, showed that the intervention emphasized skill and drill practice type activities, as also mentioned for participant 1 that may have influenced participant 2's heart rate.

Additionally, the organizational structure for this type of skill and drill practice lends itself to lines, instruction, and waiting time. Furthermore, as evidenced by the data path, we see an increasing and decreasing pattern during the first stage and when matched up with the lesson plans, we might suspect that increased knowledge and transition times due to the introduction of different activities could be a determinant of the heart rates. Within phase criterion scores for stage 1 ranged from 102.5-122.49 bpm, $\overline{X}$=112 bpm, suggesting that participant 2 exerted physical activity levels above the criterion score (actual within phase range 110.3-134 bpm, $\overline{X}$=122.3 bpm). This connotes that he was exerting varying levels of moderate physical activity in the skill-based learning stage (See Table 4.3).

Graphic display of data paths during modified game play intervention (stage 2) indicates upward trend line with variability between days 9 and 10. Participant 2 consistently reached heart rate levels that were above the lower bound for the higher end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 123-142 bpm with a mean of 132.5 bpm while an actual performance mean of 143.2 bpm was observed. Participant 2 had an average heart rate of 136.3 bpm on day 9 and spiked to 154.3 bpm on day 10 before resuming the more even upward trend line on day 11 at 145.3 bpm. Furthermore, only two out of the six data points (33%) resided within the range bound criteria while all the other data points fell above the criterion. Day 8, was the first day of stage 2 and the teacher eased in by following up with modified games that utilized skills worked on the previous class, shooting and dribbling. Again, with the knowledge and transition times that come with shooting games, average heart rates were similar to those in the previous stage, however, this time, within the criterion range. The variability between days 9 and 10 may be due to the introduction of a new modified game called “trashcan ball” that promoted passing and tactical concepts of getting open to receive a

pass and defensive positioning. Again, the increased knowledge time with the introduction of a new activity may have induced a within phase heart rate value of 136.3. By day 10, the students had seemed to get a hang of the game and it became more interactive and "fun", which potentially resulted in a spike in average heart rate values to 154.3, above the criterion range. The ensuing sessions focused on modified shooting and dribbling games that were more individualized in nature, thus allowing the students to work at their own pace. The within phase criterion scores ranged from 123.5-143.49 bpm, $\overline{X}$=132.5 bpm which was exceeded by participant 2's actual physical activity exertion levels that were above criterion scores (actual within phase range 134.3-154.3 bpm, $\overline{X}$=143.2 bpm). Furthermore, all average heart rates during stage 2 exceeded those nonconforming data points in stage 1. Figure 4.2 provides graphic display of nonconforming data points in stages 1 and 2 of intervention, demonstrating a positive trend in which data points exceeded the maximum bpm level for the range bound criteria in each respective stage.

Data paths for the combination – skill and modified game play intervention (stage 3) again indicated an upward trend line with variability between days 16 and 17. Although seven out of the ten data points (70%) were within the range bound criteria the days 17, 18, and 19 fell below the criterion level, indicating that participant 2 did not reach the desired MVPA criterion during those days. Yet, visual inspection of trend indicates that most of the data points fell within the range-bound criterion during this stage. Specifically, the range bound criterion was 143-163 bpm with a mean of 153 bpm while an actual performance mean of 148.4 was observed. While the actual performance mean was within the criteria, it fell below the criterion mean. The variability on days 17 and 18, may be attributed to participant 2 reporting that he did not feel well during activity segments of the class because it was so hot and he took voluntary breaks

during the lesson's activity time to sit on the benches and drink water before resuming activity thus lowering his average heart rates on those days to 132 bpm (day 17) and 134 bpm (day 18). On day 19 the students had just returned from spring break and this may have affected the participant's activity levels as he spent a lot of time catching up with his friends. Additionally, upon closer examination of the lesson plan, the lesson focus was on passing and moving and shooting before the modified scrimmage, in which there was more time to socialize and thus potentially lowering physical activity intensity levels. This type of activity scaffolding throughout lessons is a common practice typically used during physical education classes and can also lend its hang to social encounters. Within phase criterion scores for stage 3 ranged from 143.5-163.49 bpm, $\overline{X}$=153 bpm while the actual within phase range was 132.3-165 bpm, $\overline{X}$=148.4 bpm. This connotes that participant 2's physical activity intensity levels were within the lower level of the established criterion range. The three nonconforming data points in stage 3 of intervention fell below the criterion level but overall, data points trended in the positive direction. This again, like with participant 1, may indicate that a learning curve on how to work with others and cognitively apply tactical concepts may have been an influencing factor on activity intensity levels.

In contrast, when using the age-predicted maximal HR equation (208-0.7*Age), graphic display of the data shows similar findings to the traditional 200-age formula. Only during stage 3, did the PCD increase to 80% from 70% using the traditional formula. This connotes that for participant 2 the PCD was only minimally affected by the decrease in estimated maximal HR when using the age-predicted maximal HR versus the traditional age-estimated model.

***Participant 3*.** Participant 3 is a 20-year-old, male student with ID. He is on a non-diploma track. He does not have a skills trainer. This student is, for the most part, non-verbal

although he does have the ability to speak using limited words. He tries his best to stay on task but has some difficulty processing instructions and gets easily excited or distracted. He does much better with a visual demonstration. Participant 3 has a pretty consistent movement pattern that entails shuffling his feet rather than a normal running pattern (See Figure 4.3).

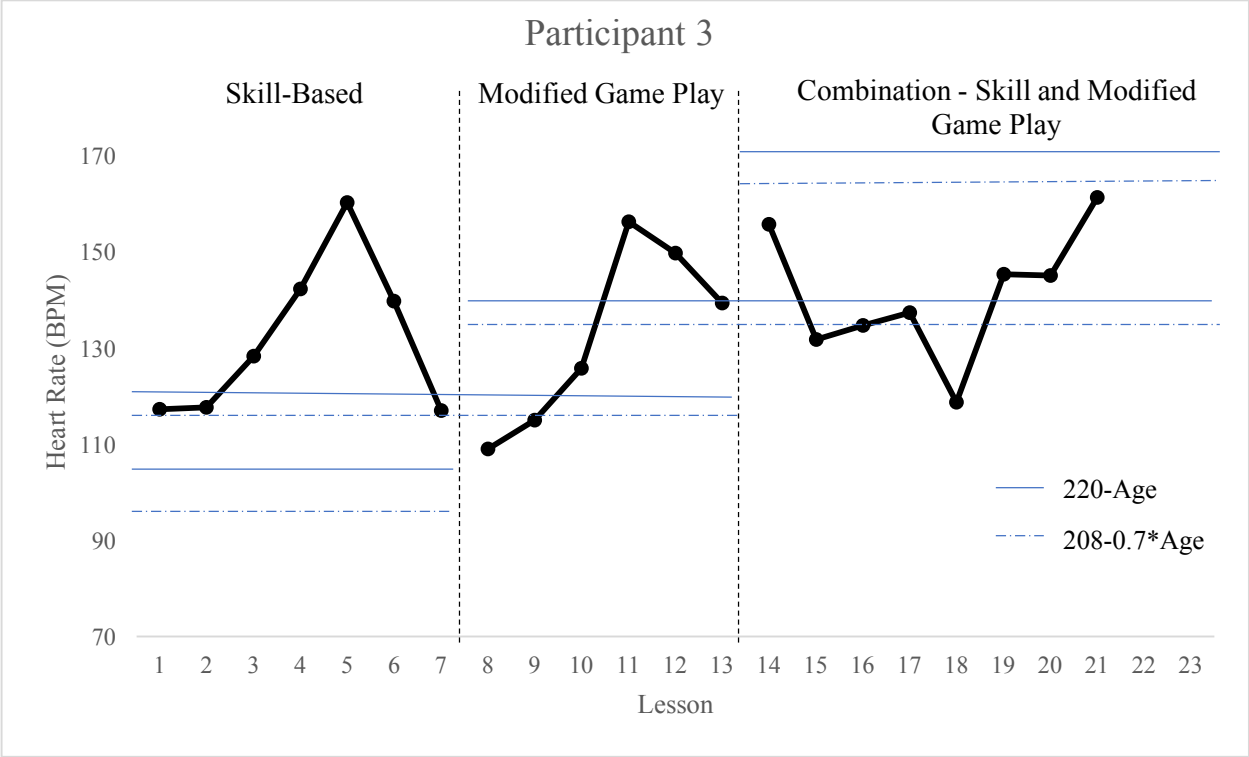

Figure 4.5: Changing Criterion Average HR (bpm) for Participant 3 Using the Age Estimated Maximal HR Equation (220-Age) and the Age-Predicted Maximal HR Equation (208-0.7*Age).

Table 4.6

Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 3 Using the Age Estimated Maximal HR Equation (220-Age).

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	106.00-120.00	113.00	117.00-160.30	131.80	3/7=43%
Intervention Stage 2	120.00-140.00	130.00	109.00-156.30	132.50	2/6=33%
Intervention Stage 3	140.00-170.00	155.00	118.70-161.30	141.20	4/8=50%

Table 4.7

*Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 3 Using the Age-Predicted Maximal HR Equation (208-0.7*Age).*

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	97.00-116.40	106.70	117.00-160.30	131.80	0/7=00%
Intervention Stage 2	116.40-135.80	126.10	109.00-156.30	132.50	1/6=17%
Intervention Stage 3	135.80-164.90	150.35	118.70-161.30	141.20	5/8=63%

Visual inspection of the curvilinear data path during skill-based intervention (stage 1), show that participant 3 consistently reached heart rate levels that were above the lower bound for the lower end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 106-120 bpm with a mean of 113 bpm, while the actual performance mean of 131.8 bpm was observed. Participant 3 demonstrated within criterion average heart rate of 117 bpm of day 1 and gradually increased to 160 bpm by day 5 before descending back down to within range criteria at 117 bpm on day 7. The variability on day 5 may be due to the fact that there were three ambulances that drove by that day and for some reason they seemed to bother participant 3 which was out of the ordinary for him. On two of the occasions he covered his ears as he ran down the court. It may have been the extra sensory sensitivity that elevated his average heart rate for the day. Again, stage 1's emphasis was the skill and drill type practice that tends to have more knowledge and transition times, especially when introducing new skills. Within criterion scores for stage 1 ranged from 106.5-120.49 bpm, $\overline{X}$=113 bpm and the actual within phase range was 117-160.3 bpm, $\overline{X}$=131.8, suggesting that participant 3 exerted physical activity levels above the criterion level. This connotes that he too was exerting high levels of physical activity in the skill-based learning stage (see Table 4.4).

Visual display of the data path during modified game play intervention (stage 2) indicates an upward trend line with variability between days 10 and, 11 and 12. Participant 3 again demonstrated a gradual increase in average heart rate from 109 bpm on day 8 to 125 bpm on day 10. On days 11 and 12 his average heart rate spiked to 156 bpm and 149 bpm, respectively, and both of those days were above the upper level of the within range criteria. Specifically, the range bound criterion was 120-140 bpm with a mean of 130 bpm. An actual performance mean of 132 bpm was observed and thus indicating that although the participant's average heart rate started below the criterion it gradually increased and approached criterion levels. Consequently, only two out of the six data points (33%) fell within the range bound criteria with two data points falling outside the range, above and below. Upon closer examination of the respective lesson plans during days 8, 9, 10, 11 and 12, we find that a few influencing factors may have been at play. Day 8 was the first day of the new stage and the lesson carry over focus was shooting. This may have been a determinant of the lower heart rate value (109 bpm) and when looking at the previous class, day 7, which also focused on shooting a lower heart rate (117 bpm) was observed. Subsequently, on days 9 and 10, "trashcan ball" was introduced and with the increased demand on knowledge and tactical understanding, participant 3's heart rate remained low on day 9 but increased on day 10, perhaps due to increased understanding of the concepts. As previously mentioned, this student does sometimes have difficulty processing verbal instructions and does better with visuals. Therefore, this may be an influencing factor on the increasing heart rate from day 9 to day 10 as he was able to see and participate on day 9 before really getting involved on day 10. On days 11 and 12 those two days of modified games emphasized dribbling which allows the students to work at their own pace. Additionally, the students enjoyed the competitive nature of the games. Within phase criterion scores ranged from 120.5-140.49 bpm, $\overline{X}$=130 bpm

which was encompassed by participant 3's actual physical activity exertion levels (range of 109-156.3 bpm, $\overline{X}$=132.5). However, it is important to note that the actual mean heart rate was greater than the criterion mean heart rate by a slim margin, connoting that the participant's heart rate was close to criterion levels.

Graphic display of data path for the combination – skill and modified game play intervention (stage 3) indicated an upward trend line with variability on day 14 and day 18. Participant 3 performed within criterion range on the first day of stage 3 (day 14) but fell out of criterion range before gradually increasing average heart rate back to within the range bound criterion of 140-170 bpm, and to a point above the within phase criterion mean of 155 bpm by day 21. His actual performance mean heart rate was 141.2 which was within the within phase criteria. During stage 3, participant 3 reached a PCD of 50% (four out of eight data points resided within the range bound criteria). He only had eight data points in stage 3 because he missed the last two days of the intervention because he went to camp. Closer examination of the lesson plans during this stage revealed that the first day of the stage (day 14) focused on dribbling and games that were used in previous lessons while day 15 had a shooting focus and days 16 and 17 were dribbling and passing centered activities. On day 15 the students were able to work at their own pace while trying to make three shots at each basket before move "clockwise or counter clockwise" to add in some integrated learning to the class. For participant 3, this was a lot to process and could have decreased activity levels while increasing knowledge time. On days 16 and 17, the dribbling drills were the same as ones used in the previous lessons while the passing drills were new to the students and involved passing in a 1-2-2 formation. This resulted in a lot of standing and idle time which may have played a role in the lower average heart rates. The variability on day 18 may be explained by the distraction caused by a friend in

class who kept talking to participant 3 during the activities and they were also partners during the passing drills. At one point, during the modified scrimmage, one of the educational assistants had to ask the friend to please stop distracting participant 3. Furthermore, unlike some of the other students who may have had a decline in activity levels when having to work with others, participant 3 had an increase in average heart rate levels as evidenced by days 19, 20, and 21 where the modified games entailed having to pass to everyone on the team before taking a shot or no one person could have a consecutive shot. This resulted in the majority of participants actively running up and down the court to participate in the offense and the defense which most likely elevated participant 3's heart rate. Within phase criterion scores for stage 3 ranged from 140.5-170.49 bpm, $\overline{X}$=155, while the actual within phase range was 118.7-161.3 bpm, $\overline{X}$=141.2 bpm, connoting that in this stage, participant 3's physical activity exertion levels were in the lower end of MVPA.

Additionally, in contrast, when using the age-predicted maximal HR equation (208-0.7*Age), graphic display of the data shows that all three stages had different PCD results when compared to the traditional 200-age formula. During Stages 1 and 2, PCD dropped to 0% in stage 1 (from 43%) and to 17% in stage 2 (from 33%) when using the age-predicted formula. Stage 3 was the only stage where the PCD increased for participant 3, when compared to the traditional formula when it increased to 63% (from 50%). The changes in PCD indicate that by using the age-predicted formula, we find a greater effect size of the intervention when comparing data to the traditional age-estimated formula.

***Participant 4*.** Participant 4 is a 15-year-old, male student with ED. He is on a non-diploma track and does not have a skills trainer. Participant 4 is a student who, for the most part, appears completely normal. He understands and follow directions well, is always on task,

consistently tries his best, and enjoys talking. He does not hesitate to help or give feedback to his peers during the activities.

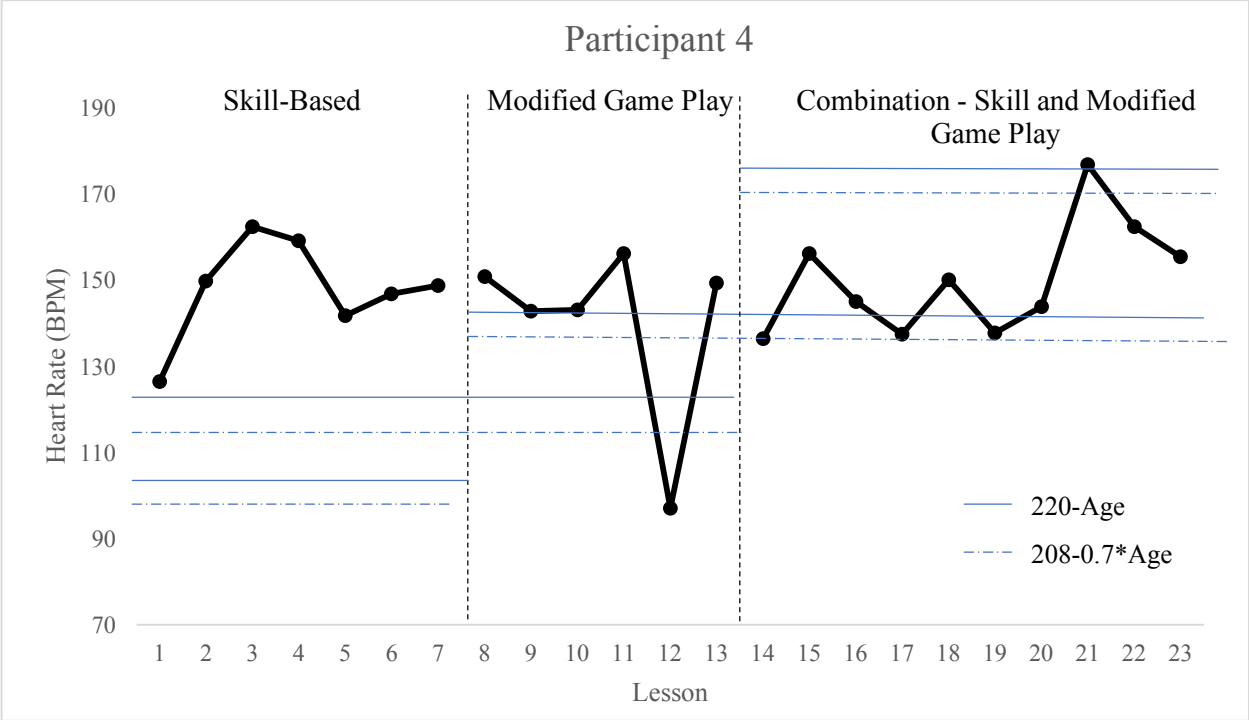

Figure 4.7: Changing Criterion Average HR (bpm) for Participant 4 Using the Age Estimated Maximal HR Equation (220-Age) and the Age-Predicted Maximal HR Equation (208-0.7*Age).

Table 4.5

Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 4 Using the Age Estimated Maximal HR Equation (220-Age).

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	102.50-123.00	112.75	126.30-162.30	147.8	0/7=0%
Intervention Stage 2	123.00-143.50	133.25	97.00-156.00	139.8	2/6=33%
Intervention Stage 3	143.50-174.25	158.88	136.30-176.70	150	6/10=60%

Table 4.9

*Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 4 Using the Age-Predicted Maximal HR Equation (208-0.7*Age).*

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	98.75-118.50	108.63	126.30-162.30	147.80	0/7=00%
Intervention Stage 2	118.50-138.25	128.38	97.00-156.00	139.80	0/6=00%
Intervention Stage 3	138.25-167.88	153.07	136.30-176.70	150.00	6/10=60%

Visual inspection of the data path during skill-based intervention (stage 1), show that participant 4 consistently reached heart rate levels that were above the upper bound for the lower end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 102-123 bpm with a mean of 112.5 bpm, and an actual performance mean of 147 bpm. A slight upward trend line from day 1 to day 7 can be observed in the data. During stage 1, participant 4 did not meet the established within range criteria at all, PCD=0% (zero out of six data points). During stage 1, skill and drill type practices, participant 4 was actively engaged in both the activities and helping out his classmates. Although these types of activities in stage 1 tend to have lower levels of activity because of the increased knowledge and transition times, participant 4 exerted physical activity levels that were above the criterion range as evidenced in Figure 4.4. Within phase criterion scores for stage 1 ranged from 102.5-123.49 bpm, $\overline{X}$=112.5 bpm while his actual within phase range was 126.3-162.3 bpm, $\overline{X}$=147.8 bpm. This connotes that he was exerting high levels of physical activity in the skill-based learning stage (Table 4.5). Throughout stage 1, participant 4 expressed his interest and excitement to play in the basketball program which may have led to higher exertion levels that may not necessarily have been directly attributed to the skill based lessons.

Data path during modified game play intervention (stage 2) indicated a stable state responding pattern with variability on day 12, and the other five out of six data points were within 15 bpm of each other. Participant 4 consistently that were at or above the upper bound for the higher end of the moderate zone for physical activity intensity. Only two out of the six data points resided within the within phase criterion, resulting in a PCD=33%. Specifically, the range bound criterion was 123-143 bpm with a mean of 133 bpm. While the actual performance mean (139.8 bpm) is only slightly above the within phase mean, the high variability on day 12 is most likely the attributing factor. Prior to class on day 12, the participant was visibly upset, pacing around, and expressing his disgust with home life and his father. During class, he frequently complained about the heat and took numerous voluntary water-breaks where he would sit down on the bench and relax while he was waiting in line or during the modified games. This behavior was atypical of him and may have influenced participant 4's heart rate. Within phase criterion scores for stage 2 ranged from 123.5-143.49 bpm, $\overline{X}$=133 bpm while the actual within phase range was 97-156 bpm, $\overline{X}$=139.8 bpm. Other than day 12, his average heart rates during stage 2, would have exceeded the criterion scores. This implies that participant 4 was more active in the modified game play activities during stage 2.

Visual display of data paths for the combination (stage 3), again indicated stable state responding with variability on the last three days (21, 22, and 23). Participant 4 consistently reached heart rate levels that were right around the MVPA level for physical activity intensity. Specifically, the range bound criterion was 143-174 bpm with a mean of 158 while the actual mean was 150 bpm. Participant 4's heart rate levels fluctuated in and out of the lower bound of the range bound criteria before peaking to 176 bpm which was outside of the upper bound of the range bound criterion, before then settling back into the criterion range. Additionally, stage 3 had

the highest PCD=60% with six out of the ten data points falling within the range bound criteria. Upon further review of the stage 3 lesson plans, on days 21, 22, and 23 the modified game play restriction of needing to pass to everyone on the team before you take a shot or no one person can take consecutive shots, that were previously utilized on days 18-20, were removed and could have influenced heart rates on those days. Additionally, the focus on the last 3 days was on shooting and dribbling, both more individualized activities where each student could more or less work at their own pace. Within phase criterion scores for stage 3 ranged from 143.5-174.49 bpm, $\overline{X}$= 158.5 bpm while the actual within phase range was 136.3-176.7 bpm, $\overline{X}$=150 bpm, connoting that in this stage, participant 4's physical activity exertion levels were within the lower end of the criterion range. Graphic display of data for stages 1, 2, and 3 in Figure 4.4 indicate that the participant showed an overall stable state response throughout the three interventions around the MVPA level.

In contrast, when comparing the use of the age-predicted maximal HR equation (208-0.7*Age), rather than the traditional formula of 220-age, graphic display of the data shows similar PCD findings. For participant 4, only during stage 2, did the PCD decrease to 0% (using the age-predicted equation) from 33% using the traditional formula. This connotes that for participant 4 the PCD was only minimally affected by the decrease in estimated maximal HR when using in age-predicted maximal HR from the traditional age-estimated model. However, the low PCD does indicate that the interventions did have a big effect on participant 4's HR levels.

Participant 5. Participant 5 is a 15-year-old, male student with ID. He is on a non-diploma track and does not have a skills trainer. Like participant 4, he is another student that you would not be able to visibly tell that he has a disability. He is a high-energy adolescent that is

highly competitive and likes to talk a lot. He does not always follow directions although he seems to understand them clearly. This participant is a constant competitor. He is in constant competition with other students in class even when the other students aren't competing against him (for example in a skill and drill setting – stage 1). He is also not much a team player but would rather do things on his own if given the choice. Of all the students in the class, he needs to work on the affective domain of learning and athletics the most as his behavior and communication with others can be inappropriate (i.e. use of swear words, ripping the ball out from a female student's hands, etc.).

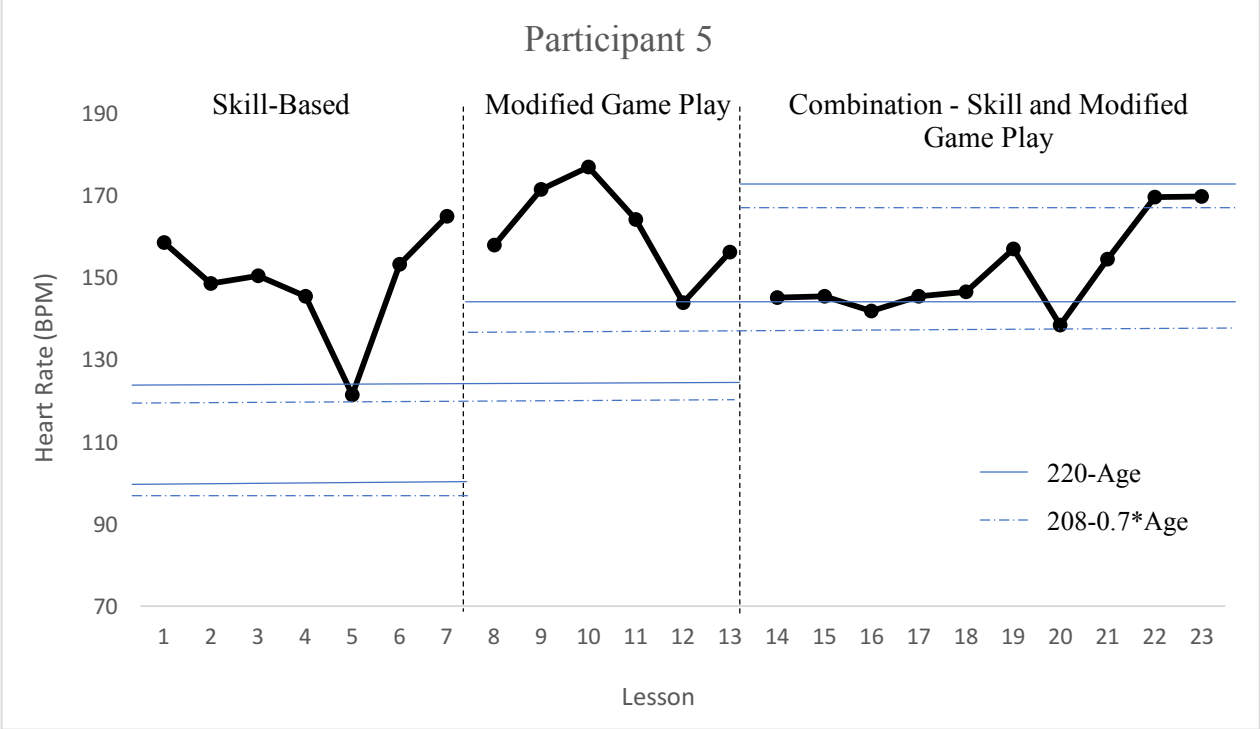

Figure 4.9: Changing Criterion Average HR (bpm) for Participant 5 Using the Age Estimated Maximal HR Equation (220-Age) and the Age-Predicted Maximal HR Equation (208-0.7*Age).

Table 4.10

Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 5 Using the Age Estimated Maximal HR Equation (220-Age).

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	102.50-123.00	112.75	121.30-164.70	148.70	1/7=14%
Intervention Stage 2	123.00-143.50	133.25	143.70-176.70	161.60	0/6=00%
Intervention Stage 3	143.50-174.25	158.88	138.30-169.50	151.20	8/10=80%

Table 4.11

*Changes in Average HR as they Conform to Changes in Performance Criteria for Participant 5 Using the Age-Predicted Maximal HR Equation (208-0.7*Age).*

Phase	*Within-phase criteria*		*Actual performance*		*PCD*
	Range	*Mean*	*Range*	*Mean*	
Intervention Stage 1	98.75-118.50	108.63	121.30-164.70	148.70	0/7=00%
Intervention Stage 2	118.50-138.25	128.38	143.70-176.70	161.60	0/6=00%
Intervention Stage 3	138.25-167.88	153.07	138.30-169.50	151.20	8/10=80%

Visual display of the data path during skill-based intervention (stage 1), show that participant 5 consistently reached heart rate levels that were well above the lower bound for the lower end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 102-123 bpm with a mean of 112 bpm, while the actual performance mean of 148.7 bpm was observed. Stage 1 data path showed a very slight upward, curvilinear, trend line with variability on day 5. Furthermore, only one out of seven data points (14%) fell within the within range criterion. Closer examination of the lesson plans for stage 1, revealed that on days 4 and 5, the lesson focus was on passing the ball. Day 4 was the introduction to passing and the students were able to pick their own partners to work with, however, on day 5, the students had to work with everyone in the class. The activities on day 5 also required some cognitive understanding on

moving to get open, which in nature, will slow down the activity, especially for some of the students in this class. So, although, the competitive nature of this student may have wanted to set in, the requirement of working with his peers of different abilities may have suppressed activity levels. Within phase criterion scores for stage 1 ranged from 102.5-123.49 bpm, $\overline{X}$=112.5, suggesting that participant 5 exerted physical activity levels above the criterion score (actual within phase range 121.3-164.7 bpm, $\overline{X}$=148.7 bpm). This connotes that he was exerting high levels of physical activity even in the skill-based learning stage (See Table 1). Participant 5 could also be heard telling his teammates how excited he was about the basketball program which may have led to higher exertion levels that may not have been directly attributed to the lessons.

Visual inspection of the data path during modified game play intervention (stage 2) indicates a slight downward trend line. During stage 2, participant 5 consistently reached heart rate levels that were above the lower bound for the high end of the moderate zone for physical activity intensity. Specifically, the range bound criterion was 123-143 bpm with a mean of 133 bpm. The actual performance mean was 161 bpm which fell above the established criterion range. Consequently, zero out of six data points (0%) fell within the within phase criterion. Participant 5 seemed to thrive in stage 2 as all activities were modified games and therefore there was the competition element throughout the lessons. His average heart rate peaked on day 10 as that was the second day of "trashcan ball" where he enjoyed being both the defender of the cans and the attacker. However, on day 12 we see some variability in the data with a drop in his average heart rate to criterion levels. This drop may have been a result of his friend and favorite or closest competitor (participant 4) having a tough day and taking breaks during the activities. This caused participant 5 to have a hard time finding partners for activities and he spent a lot of time figuring out who he wanted to challenge which thereby increased transition times. Within

phase criterion scores ranged from 123.5-143.49 bpm, $\overline{X}$=133 which was exceeded by participant 5's actual physical activity exertion levels that were above criterion scores (actual within phase range 143.7-176.7 bpm, $\overline{X}$=161.6 bpm). This implies that participant 5 was more active in the modified game play activities during stage 2. Figure 4.5 provides a graphic display of nonconforming data points in stages 1 and 2 of intervention demonstrating a positive trend in which the data points exceeded the maximum bpm level for the range bound criteria.

Visual inspection of the data path for the combination (stage 3) indicated a stable state responding before a gradual shift towards an upward trend. During stage 3, participant 5 consistently reached heart rate levels that were within the MVPA range of physical activity intensity with the exception of two data points, days 16 and 20. Specifically, the range bound criterion was 143-174 bpm with a mean of 158.5 and an actual performance mean heart rate of 151.2 was observed. Although the actual performance mean was lower than the established range bound mean, Participant 5 had the highest PCD during this stage (80%) with eight out of ten data points falling within the within stage criteria. During stage 3 a stable state response can be seen on days 14-18. On those days, the skill focus was on either dribbling and shooting or passing and shooting. As previously discussed, shooting drills can increase knowledge and transition times as the students took set shots from different ranges around the basket to finish the drills. Furthermore, as only one person in the group would shoot if the focus was on passing and shooting, this would result in the other members of the group standing idle while the shot was taken. When the skill focus was on dribbling and shooting, the students were able to dribble and find a spot that they wanted to shoot from and could also take some time as they decided where to shoot from, line up their shot, set their feet, and ultimately shoot the ball. Upon closer examination of stage 3, it is also interesting to note that Spring Break happened between days 17

and 18. It may imply that participant 5 may have been getting over the excitement of the basketball program by day 17 and then with the break resumed day 18 reenergized. Additionally, day 18-20 the introduction of modified scrimmages came into play and students participated in small-sided scrimmages that required everyone to touch the ball before a shot was taken or no consecutive shots by one person was allowed. From day 21-23 the restrictions were removed but teaching assistants helped to modify the games by getting others involved. This added an extra level of competition for participant 5 as he saw the teaching assistants as true competition. Consequently, this may imply that the need to work at a pace that is influenced by others may have lowered physical activity intensity levels while his competitive nature still allowed him to achieve MVPA levels. Within phase criterion scores for stage 3 ranged from 143.5-174.49 bpm, $\overline{X}$=158.5, while actual within phase range was 138.3-169.5 bpm, $\overline{X}$=151.2, connoting that in this stage, participant 5's physical activity exertion levels were within the criteria. Graphic display of the data points throughout all stages of intervention demonstrate that participant 5 responded to intervention in a stable state in the MVPA range.

Again, in contrast, when using the age-predicted maximal HR equation (208-0.7*Age), rather than the traditional formula of 220-age, graphic display of the data shows similar but slightly lower PCD findings. For participant 5, only during stage 1, did the PCD decrease to 0% (using the age-predicted equation) from 14% using the traditional formula. This implies that for participant 5 the PCD was similar despite the decrease in estimated maximal HR when using in age-predicted maximal HR from the traditional age-estimated model. However, the low PCD does indicate that the interventions did have a big effect on participant 5's HR levels.

Chi-Square Between Stages. A chi-square test of goodness-of-fit was performed to determine whether the PCD using the age-estimated (220-age) formula in the three stages were

equal. PCD for the three stages was not equally distributed in the population, X^2 (2, N = 111) =20.19, p = 0.00, suggesting that there were differences in PCD based on the stage. A second chi-square test of goodness-of-fit was performed to determine whether the PCD using the age-predicted (208-0.7*age) formula in the three stages were equal. PCD for the three stages was not equally distributed in the population, X^2 (2, N = 111) =29.94, p = 0.00, again, suggesting that there were differences in PCD based on the stage.

RPE. Data in Table 4.7 indicate that RPE varied greatly by participant throughout the intervention phases for all participants during the implementation of the intervention. RPE, as previously discussed, is a perceptual ratings scale of physical exertion. The scale used was modified for this population of individuals but cognitive understanding varied.

***Participant 1*.** During intervention, most of participant 1's responses ranged from "very easy" (RPE =1) to "kind of easy" (RPE=2). At no point, did he report an RPE that was greater than "kind of easy". Only during five lessons (out of 21 attended) did he report an RPE other than "very easy".

***Participant 2*.** During intervention participant 2 consistently reported feelings of exertion that were greater than "very easy". He also had seven data points that were approaching or at the exertion level of "very hard, so hard that I want to stop" (RPE =4). Eleven data points also fell in the range of "kind of easy" (RPE =2) to "kind of hard" (RPE =3). Participant 2 was the only participant who reported increasing RPE levels throughout the intervention stages which aligned with the average heart rate level increases.

***Participant 3*.** During intervention participant 3 reported eleven times that he felt that he was working in the "very easy" to "kind of easy" range. He also reported six times that he was exerting himself in the "kind of easy" to "kind of hard range". At no point in the intervention did

this participant report that he was exerting himself at a level of "kind of hard" to "very hard, so hard that I want to stop".

***Participant 4*.** During intervention participant 4's responses seemed to vary by day. During stage 1, he reported that six out of seven days that he was working in the "very easy" to "kind of easy range". In stage two, three out of six days he was working in the "kind of easy" to "kind of hard" range. While, only once in stage 3 did he report that he felt as though he was working in the "kind of hard" to "very hard, so hard I want to stop" range. In addition to stage 1 data points, on eight other days, the participant reported that he felt that he was working in the "very easy" to "kind of easy" range.

***Participant 5*.** During intervention participant 4 reported eighteen times that he felt that he was working in the "very easy" to "kind of easy" range, three times that he felt that he was working in the "kind of easy" to "kind of hard" range, and only once did he report that he was working in the range of "kind of hard" to "very hard, so hard I want to stop".

Table 4.7

RPE Means for Intervention Stages for All Participants.

Phase	*Participant 1 Mean RPE*	*Participant 2 Mean RPE*	*Participant 3 Mean RPE*	*Participant 4 Mean RPE*	*Participant 5 Mean RPE*
Intervention Stage 1	1.3	3.1	2.3	1.6	1.7
Intervention Stage 2	1	3.2	1.7	2.1	1.9
Intervention Stage 3	1.1	3.4	1.7	1.8	1.8

Correlation of HR and RPE Values

Extremely weak, non-significant, positive correlations (r = 0.04 to 0.14) were found for participant HR and participant reported RPE for participants 2, 3, and 5. Participants 1 and 4 also had extremely weak, non-significant negative correlations (r = -0.13 and -0.03) between their actual HR and reported RPE levels. Although the modified RPE scale had been previously validated for use with adults with disabilities in a laboratory setting, the field setting and the sample population in this study may be explanatory factors in the low correlations.

Fitness Outcomes

Table 4.8

Descriptive Statistics and Percent Change for the Timed One-Mile Run/Walk Test to Assess Aerobic Fitness

Participant	Pre	Post	Percent Change
1	9:32	10:08	0.06
2	15:20	11:13	-0.27
3	11:21	14:58	0.32
4	11:55	11:07	-0.06
5	9:32	9:01	-0.05
M	11:32	11:17	-0.02
SD	0.1	0.09	

A parametric, t-test for two paired sample means (p=0.65) and a non-parametric Wilcoxon Signed-Ranks Test (Z=-0.405, p=0.69, r=-0.13), both indicated no significant differences between pre- and post-one-mile run/walk times, indicating that the basketball program did not have a significant impact on aerobic fitness.

Skill Outcomes

Table 4.9

Descriptive Statistics for the PE Metrics Basketball Skills Assessment

	Ball Skills		Offensive Play		Individual Defensive Play		Total	
Participant	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	1	3	2	2	2	3	7	12
2	2	3	2	2	1	2	5	8
3	1	1	1	1	1	1	3	5
4	1	3	2	2	2	3	7	12
5	1	2	2	2	2	3	7	12
M	1.25	2.5	1.75	1.75	1.5	2.25	5.5	6.6
SD	0.71	1.41	0.89	0.89	0.84	1.3	2.97	5.08

A Wilcoxon Signed-Ranks Test indicated that there were no significant differences between pre- and post-test ball skills and total scores, $Z=-1.857$, $p=0.063$, $r=-0.59$. Although no significant differences were found between the pre- and post-test ball skills and total scores, a large effect size was found. No significant differences were also found between pre- and post-test offensive play scores, $Z=0$, $p=1.0$, $r=0$. However, the Wilcoxon Signed-Ranks Test indicated that there were significant differences between pre- and post-test individual defensive play score, $Z=-2.0$, $p=0.046$; and $r=-0.63$, connoting a large effect size. The large effect sizes seen in pre- and post- ball skills and individual defensive play describe the large differences observed in the pre- and post- testing scores of the two skills. Findings indicate that although improvements were observed, that the basketball program had no significant impact on basketball ball skills, offensive skills, or total playing ability. However, the program did significantly increase individual defensive skills.

Social Validity

Social validity questionnaires were developed and administered to relevant consumers of the program to assess their perceptions about the intervention. Cooper et al., (2007) indicated the importance of the social validity assessment to evaluate the significance of the target behavior, acceptability of the procedures, and the social importance. Questionnaires and brief interviews were given to participants and teachers.

Students. Overall, there was a consensus that the students enjoyed the program and wish it would expand to other sports like soccer, softball, and football. The students also felt as though they made new friends by participating in the program, that their basketball skills improved, and that they felt more confident and important at school. The students all said that they absolutely agreed that they really enjoyed being part of the team.

Teachers/Coaches. Teachers both agreed that the basketball program had the same physical and affective benefits that come with physical activity and interscholastic participation for all students. Specifically, the teachers cited "increased socialization, leadership skills, and sportsmanship" as positive affective outcomes. They agreed that there is a need for this type of program for students with disabilities in schools because it provides positive outcomes such as, "increased physical activity" and "increased social interactions and relationships". The teachers also agreed that the participants enjoyed the program, but there are a few students who may have preferred a different activity. Interestingly, both teachers recommended that the program be expanded to also include "indoor soccer".

Additionally, the more senior of the two teachers mentioned that the program may have also helped the school with their WASC accreditation, as he believes the inclusive basketball program showed that their school is proactive in programming activities that promote inclusion.

He suggests that the program is easy to implement, especially if the other schools are provided with a curriculum or activities planner.

Discussion

The findings in this range bound changing criterion and quasi-experimental study provided much needed insight on the heart rate responses of high school students with special needs from skill-based, modified game play, and combination-skill and modified game play learning during a 10-week inclusive basketball program. Additionally, the study provided preliminary data on the effectiveness of using a modified RPE scale, fitness, sport-skill, and social validity outcomes for students with special needs.

Visual analysis of the data showed that average heart rates increased during stages 2 and 3, from intervention stage 1 – skill-based learning, across all participants. However, average heart rate changes were minimal between stages 2 – modified game play and 3 – combination-skill and modified game play. Furthermore, a steady state responding pattern in the MVPA level, between stages 2 and 3 were seen for all participants except participant 3, whose data was much more variable than the other participants. Lessons that included the individual skills of dribbling and shooting combined with a modified game elicited the highest average heart rate levels, as evidenced by the highest percentage of conforming data in Stage 3 by all the participants. These findings are supported by previous research that found that physical activity interventions, such as the SPARK curriculum activities, that were used in a modified form for the intervention lessons, have produced greater amounts of MVPA during lessons when compared to the more traditional skill and drill approach to physical education (Locke & Lambdin, 2003; Lonsdale et al., 2013; Sallis et al., 1997). The scaffolding of activities to incorporate skill based fitness

(i.e. lay-up drills or modified fast break situations) that utilize both dribbling and shooting, combined with modified game play produced positive heart rate responses in the MVPA range in this study.

The lessons that also promoted individual competitiveness had higher observed levels of average heart rates while the activities that had a teamwork element, which increased the need to work at a pace that was influenced by others often decreased physical activity intensity levels of participants 1, 2, 4, and 5. However, once the students had a better understanding of how to work together, MVPA was maintained during those lessons. Through further inspection of data paths and field notes of participant 3, there seems to be a link between understanding instructions and physical activity intensity or activity participation levels. During the modified game play, stage 2, the teacher introduced the game "trashcan ball" that had a focus on team tactics and passing. On the first day of introduction to this game the participants all presented lower average heart rate values than the second day where the students had a better understanding of the game and tactical concepts. This is analogous to a learning curve for fitness tasks or assessments.

Despite the learning curve and extraneous variables, which could not be controlled for, such as mood, environment, and predispositions, the intervention was successful in achieving at least moderate physical activity and in most cases, MVPA was reached during the intervention stages, which approaches recommended physical activity guidelines of 60 minutes of moderate physical activity every day (https://www.cdc.gov/physicalactivity/basics/). Basketball and other recreational sports are great activities as they are also considered bone strengthening activities as it entails running and jumping. This particular finding is especially important for this population as previous research indicates that the majority of individuals with disabilities, particularly children and adolescents do not meet recommended physical activity guidelines and have a

higher prevalence of overweight and obesity compared to their nondisabled peers (Hallawell, Stephens, & Charnock, 2012; Jakicic & Gibbs, 2016; Lin et al., 2010; McCoy et al., 2016; Rimmer et al., 2007).

Additionally, the project utilized two settings, the outdoor courts and the indoor gym, because of the nature of school facilities and availability of resources. The two environments may have had a small impact on heart rate but a bigger impact on RPE as the temperature felt hotter on the outdoor courts due to the exposure to direct sunlight. These findings are supported by previous literature that also found no significant differences between heart rate in heat and thermoneutral environments (Leites et al., 2013). However, Flouris and Schlader (2015) did note that RPE is influenced by heat and therefore, the high temperatures may have led the participants to perceive that they were working harder than they actually were. Table 4.7 shows that three of the five participants had higher or the same RPE ratings in stage 2 than stage 3, when in actuality they were working at an intensity level less than or equal to stage 3. Although temperatures throughout stage 2 and 3 were fairly consistent, there were more sessions held on the outside courts during stage 2 than stage 3.

RPE reporting varied tremendously and fared on the low end of the scale (towards the "very easy to kind of easy" end) and thus resulted in an extremely weak correlation coefficient found between RPE self-reports and actual HR. So, although there is a known linear relationship between HR and RPE that is used to predict VO_2 across exercise intensities (ACSM, 2014; Bassett, 2000), we don't see similar relationships in this population. This data also goes against the literature out there that indicates that individuals with ID can accurately assess their RPE (Arnhold, Ng, & Pechar, 1992). However, in this study, only one participant reported RPE values that similarly mirrored heart rate increases. There seemed to be a gap in understanding on how to

interpret “how they felt” using the scale that led to seemingly inaccurate responses, despite the fact that the Children’s OMNI 1-10 Run/Walk Scale and the Modified Children’s OMNI 4-point scale have been validated and proven useful for this population in lab settings (Chen, Ringenbach, Snow, & Hunt, 2013; Robertson et al., 2006; Stanish & Aucoin, 2007). A different scale for this population in field settings might be worth pursuing as it may lead to better and more accurate measures. Perhaps measures such as “How was your breathing?”, “How did your legs feel?”, or “How was your heart beat?” may need to be used to obtain accurate information on RPE for individuals with disabilities.

Overall aerobic fitness, ball skills, offensive skills, and total playing ability were not affected by the intervention. However, individual defensive play did improve and this may have been a result of increased cognitive understanding, confidence and desire to participate in the play. Aerobic fitness, was determined and measured by the timed one-mile run/walk test which was administered pre- and post-intervention. Three out of the five participants did decrease their mile time and two participants had time increases, thus no significant differences were observed. It has been documented that typically there are no training effects during skill-based learning (Everhart et al., 199; Ignico, 1994). However, Gabbert, Jenkins, and Abernethy (2009) state that game-based training can improve fitness more than traditional conditioning methods and have comparable skill increases as skill-based training. This may indicate that more research needs to be done in this area. We can though, note that the decreases in mile time could have been a result of increased motivation or confidence, especially in this population. Secondly, there could have been intervening factors that affected the two participants who had increased mile times. Participant 1, prior to the pre-test, was running at least one mile every day at lunch because he wanted to beat his friend, participant 5. However, he did not beat participant 5 during the pre-

test, they ran together and tied. His skills trainer said that he was discouraged after that and "gave up" running at lunch but he was also being influenced by participant 5 to have lunch with their group. Those events, in combination, could have played a role in the fitness losses. On the other hand, participant 3, as previously mentioned, is easily distracted. He ran alone and seemed to be watching the other general PE class play flag football on the field. Similarly, improvements were observed for all the basketball skills for participants 1, 2, 4, and 5 while participant 3's scores remained the same.

The improvements for ball skills and offensive play were approaching significance but only defensive play was found to have significantly increased. Running back on defense, putting your hands up, and defensive positioning on the court were worked on throughout the intervention stages 2 and 3 but were not the main focus of the lessons. Additionally, increased confidence and motivation to participate may have also contributed to the increase in scores, as during the pre-test there were lower levels of participation and much more standing around. This is supported by previous studies that found that participation in exercise and sport-related activities elevates self-efficacy and social competence (Dyson, Griffin, & Hastie, 2004; Hutzler & Korsensky, 2010).

Social validity findings though, did indicate that this is a program that is supported by students and teachers. The overwhelming positive support for this program adds to the body of evidence that more organized inclusive sport opportunities are needed in our communities and school settings. Enjoyment and positive health and social outcomes were cited, by teachers, as benefits of the program. These positive social outcomes along with the positive perceptions of physical activity that it creates could be the biggest benefits of this study and intervention. Programs that are accessible and have the capability to adapt activities for inclusion of all

children for the physical and social health benefits are programs that tend to create positive physical activity experiences that can be positive determinants in children wanting to engage in physical activity (Barr & Shields, 2011). Although access and equal opportunities in extracurricular activities are mandated by law, there still remains much fewer extracurricular opportunities for individuals with disabilities than there are for individuals without disabilities (McCoy, Jakicic, & Gibbs, 2016; Rimmer & Rowland, 2008; Rimmer, et al., 2007). Unified Sports, by Special Olympics has grown by 9% from 2011-2015, indicating the positive trend of participation by athletes with and without disabilities alike and the need for these programs (Pan & Davis, 2015). Additionally, the social interaction that an inclusive athletic program can facilitate can benefit physical health, cognitive and academic development, and mental health which is specifically important to this population (Bailey, 2005). Individual Transition Plans can then include participation in extracurricular sport, recreation, or health-related physical activities that if practiced during the adolescent years can lead to positive lifelong behaviors and a greater sense of overall well-being.

Chapter V

Conclusion, Research Questions, Implications

This chapter provides a summary of the effects of the basketball program intervention on HR, RPE, aerobic fitness, and basketball skills among high school students with disabilities. The summary focuses on each of the research questions, perceived and observed limitations of the study, implications for practice and suggestions for future research, and finally a conclusion.

Research Questions

Question 1: What effects did the intervention have on average heart rate among students with disabilities? Visual analyses of graphed data suggest that the intervention was successful in increasing the participants' heart rate to MVPA levels. To demonstrate the effects of the intervention, a range bound changing criterion design was implemented. Participants 1, 2, 4 and 5 consistently achieved heart rate levels that were above stage 1 and 2 criterion levels and the highest percentage of conforming data in stage 3. Participant 3 demonstrated the most variable heart rate responses to the intervention.

For participants 1 and 5, mean heart rates increased across stages 1 and 2 but then decreased slightly in stage 3. Mean heart rates for both participants 1 and 5 were greater than the upper bound of the criterion range during stages 1 and 2, but mean heart rates were within the criterion range for stage 3.

For participants 2 and 3, increases in mean heart rate across stages was observed. Participant 2's mean heart rates were within the criterion range across intervention stages. Mean heart rate for participant 3 during stage 1 was above the criterion range but mean heart rates were within the criterion range during stages 2 and 3.

For participant 4, mean heart rate decreased in stage 2, however, during that stage the participant had a single day where he was presenting atypical behavior that decreased the mean heart rate for the stage. Visual inspection of the data shows that if that day were removed, mean heart rates would have been similar to stages 1 and 3. Mean heart rates for participant 4 were within the criterion range, except for in stage 1 where mean heart rate exceeded the upper bound for the criterion range.

While behavior stability was somewhat achieved, high variability was observed for participant 3 and stability was often achieved above criterion level for the participants during stages 1 and 2. This may indicate the ability to add more fitness type activities into the lessons to illicit and set even higher criterion levels to achieve short bouts of vigorous physical activity that have additional health benefits.

Verification of the data was demonstrated when across all participants, mean heart rates were lowest in the skill-based learning stage (stage 1). Physical education interventions, such as the SPARK curriculum, have been shown to have positive effects on MVPA compared to usual skill and drill type classes (Lonsdale et al., 2013). The implementation of the SPARK lessons that include skill and fitness activity components have been shown to significantly increase physical activity and MVPA in physical education classes (Locke & Lambdin, 2003; Sallis et al., 1997). This current study found similar results among students with disabilities.

Question 2: What effects did the intervention have on the RPE among students with disabilities? The participants were able to make the self-reports of RPE, reporting varied by individual. It is unclear whether the participants were rating their physical exertion, the task/activity itself, or if their enjoyment of the activity played a role in the response. Although all

of the participants had reached MVPA levels, only one of the participants consistently reported feelings that they were working in the "kind of hard" or "very hard, so hard I want to stop" range.

This might be interpreted in a couple of ways. First, it is good most of the participants did not feel that the activity was so hard that they wanted to stop, because that feeling may be discouraging to recreationally active individuals. Second, some participants never actually reached vigorous physical activity so they may not have felt that they were working "kind of hard" or "very hard, so hard I want to stop". Third, there was a gap in cognitive understanding of RPE and how to actual implement its use during this study. Cognitive interpretation of "how they felt" may not have been truly realized by participants given their disabilities. To this end, more accurate measures that refer to feelings in the large muscles (legs, chest, and heart) may need to be used to obtain accurate information on RPE.

Question 3: Were the participants able to accurately assess exercise intensity using the modified Children's OMNI Run/Walk Scale? As evidenced by the extremely weak, non-significant, correlations between participants' actual HR and participants' reported RPE, the participants were unable to accurately assess exercise intensity using the modified RPE scale. The modified RPE scale had been previously validated for use with adults with disabilities in a laboratory setting (Chen et al., 2013). The variability of disability classification type of the sample, the limitation of only four-scale points, and the setting (indoor gym or outdoor courts) can be possible determinants of the weak correlations. Additionally, the cognitive understanding may need to be developed further. A longer training period where different cues regarding feelings of one's heartbeat, chest heaviness, and leg heaviness may be helpful in aiding understanding of the RPE scale. Furthermore, training on how to decipher exertion versus the

activity or skill difficulty might need to be distinguished as well, being as though self-efficacy and difficulty learning an activity does play a role in predicting physical activity behavior (Stanish et al., 2016).

Question 4: What aerobic fitness effects did the program have on its participants? The basketball program did not have an effect on aerobic fitness. Despite the increases in MVPA, and decreases in the one-mile run/walk times seen among three of the participants, no significant differences (p=.69) in aerobic fitness were found. Additionally, a small effect size was calculated (r=-0.13), indicating that small differences were made with the intervention. A -0.02 percent change was observed across participants' mile time scores. It is important to note that if the intervention was longer and the students were able to meet at least three times a week, the likelihood of significant improvements in aerobic fitness may have been found similar to the gains found through the Unified Sports program (Baran et al., 2013). Including a fitness only component to the lessons, rather than using skill-based fitness (i.e. layup drills) may have also increased fitness gains and enhanced the training effect.

Question 5: What sport-skill effects did the program have on its participants? Sport-skill was assessed through the use of the PE Metrics Basketball Skills Assessment Rubric. Basketball ball-skills, offensive play, and individual defensive play were assessed. The intervention had no effect basketball ball-skills and offensive play. Ball-skills did improve across participant's 1, 2, 4, and 5 but the gains were not significant. Individual defensive play, however, did improve with the 10-week intervention. Participant 3 saw no change across pre- and post-test scores for any of the three skills.

Limitations

When evaluating the results of this study, a number of limitations need to be discussed. The first limitation was that the intervention was implemented over 10-weeks but only 23 class sessions. The 23 sessions were held during pre-scheduled physical education classes. An alternating day schedule was used but due to holidays, testing, and administration days the class meetings rarely followed a true alternating schedule. Only during three out of the ten weeks did the class meet three times a week. All other weeks there were only two meeting days. This may have had an impact on aerobic fitness outcomes.

A second limitation was that the class session setting was not consistent and was based on the availability and scheduling of facilities to accommodate the other physical education classes at the school. The indoor gym (six baskets and a full-size court or two small courts) and the outside basketball courts (four baskets and two smaller courts) were both utilized throughout the intervention stages. Although the gym would get hot because of the humidity, at the outdoor courts, on asphalt, the students were subjected the afternoon sun and heat. These conditions sometimes made it difficult for the teacher to sustain the attention and efforts of all of the students.

A third, and perhaps the most prominent limitation is that the heart rates were averaged from three readings over the course of the lesson. By doing so, may have led to inaccurate data points, as heart rates may have been dependent on the student's activity behavior immediately prior to the time of collection. Although it may be the expectation of the teacher that the students participate throughout the whole activity and until they are excused for a water break, this is not the case. For instance, taking the heart rate reading for someone who had just completed a "fast break" and who ran back to the line would be very different than his or her classmate's heart rate

who completed the same "fast break" but walked back, or someone who waiting for his or her turn was just standing in line. Furthermore, a student who actively participates in a modified game would have a very different heart rate than a student who is walking around and talking to his or her friends during the same activity.

Finally, a fourth limitation is that with this population, even more so than with the general education students, absenteeism was unavoidable. Most of the students in the class missed at least a day or two because of field trips, camp, illness, travel, or meetings/assessments. This coupled with the time constraints of the program, limited the intervention days that the students were able to participate in. Likewise, on weeks where the class only met twice, a student who missed one day would have only been able to participate in one day that week, which most likely limited the positive outcomes of physical activity. Absenteeism cannot be controlled for, especially in the school setting.

Implications for Professional Practice

Schools play an important role in promoting healthy lifestyle behaviors, including the promotion of physical activity. Thus, there is a need to increase the availability of inclusive intramural programs that especially benefit students with special needs, who often times do not have the same opportunities to participate on their high school athletic teams. With the support of school administration, teachers, and parents, inclusive sports programs can use a collaborative approach to increase such opportunities. The program practices can be completed during the school's adapted physical education classes with the help of student teaching assistants. The environment is inclusive and promotes social and physical health. Additionally, by using the SPARK curriculum or a mix of skills and modified games in the lesson plans can illicit physical activity that is in the moderate to vigorous range. Based on the findings of this study, leaders of

these such programs should stray away from the traditional skill and drill type practices that have been found to produce lower physical activity levels. Inclusive interscholastic sports programs provide opportunities to achieve recommended amounts of daily MVPA and have the additional affective benefits of increasing and promoting confidence in sports skills, socialization, leadership, school spirit and pride, and sportsmanship. This program provides further proof that interscholastic extracurricular activities need to be accessible and offered to students with and without disabilities as mandated by federal requirements (Office of Civil Rights, http://www2.ed.gov/about/offices/list/ocr/letters/colleague-201301-504.html). These positive outcomes can improve outcomes for all students who are involved.

Suggestions for Future Research

This study has shown that an inclusive intramural basketball program for students with special needs can illicit heart rate levels that are in the MVPA range. However, there is a need for additional research with this population in field settings. It is suggested that future research should:

1. Implement similar interventions across a variety of sports to determine if the benefits can be generalized across other opportunities.
2. Further examine the use of the RPE scale in this population and attempt to create a modified RPE scale that can be validated and used for this population.
3. Examine the effects on physical activity behavior changes outside of school hours in order to ascertain whether or not the program increases motivation for these students to increase physical activity during their own leisure time.
4. Design similar interventions to determine whether or not the sport activities can illicit vigorous physical activity for this population.

5. Examine whether or not MVPA and vigorous physical activity cut-points are the same for students with and without disabilities. For example, MVPA cut-points are set at 70-85% of age-estimated maximal heart rate and vigorous physical activity is then heart rates greater than 85% of the age-estimated maximal heart rate (CDC, 2015).
6. Attempt a longitudinal study that follows students with special needs who participate in inclusive interscholastic sports programs and those who do not to examine the long-term outcomes of program participation.

Conclusion

The purpose of this study was to examine the effects of a 10-week inclusive intramural basketball program for students with disabilities on fitness, sport-skill, and perceptual outcomes. This study was the first to use an intervention based on different teaching methods to illicit moderate to vigorous physical activity with the purpose of increasing positive health outcomes. The participants for the basketball program were five students with either intellectual disability, autism spectrum disorder, or emotional disorder who attend a local high school in Hawaii. The study implemented a range bound changing criterion design and physical activity intensity was objectively measured through the use of Garmin Vivosmart HR wrist-worn heart rate monitors. Participants were also asked to self-report RPE scores in accordance to their subjective feelings of exertion. In addition to physical activity measures, a quasi-experimental design was used to measure pre- and post-aerobic fitness and sport-skill outcomes via the use of the FITNESSGRAM's one-mile run/walk test and the PE Metrics Basketball Skills Assessment Rubric. Finally, perceptual outcomes were collected by the use of survey questionnaires and brief interviews.

Changes in heart rate across intervention between stage 1 and stages 2 and 3 suggest that the intervention had positive effects on physical activity intensity, resulting in greater adherence to physical activity recommendations. Students, however, were unable to accurately assess their own physical activity intensity through the use of a modified RPE scale. Although positive changes were seen in physical activity intensity throughout the intervention no significant changes were observed in aerobic fitness and sport-skill acquisition. However, it is important to note that decreases in one-mile run/walk times were observed, which is an indicator of positive change. Individual defensive play did improve significantly but this might be explained by the increased participation and enjoyment in the game-play. That in itself speaks to the fact that the students did express enjoyment of the program and their excitement of being part of the team.

With the help of laws that require accessibility and inclusion of students with disabilities in extracurricular events and the continuous national efforts to promote physical activity for all individuals, the need for more inclusive intramural programs are increasing ever more. These programs have numerous health and social benefits that warrant continued intervention research for this population.

Appendix A

Institutional Review Board Approval (and Renewal)

Office of Research Compliance
Human Studies Program

UNIVERSITY of HAWAI'I® MĀNOA

MEMORANDUM

April 27, 2016

TO: Allison Tsuchida
Nathan Murata, Ph.D.
Principal Investigator
Kinesiology & Rehabilitation Science

FROM: Denise A. Lin-DeShetler, MPH, MA
Director

SUBJECT: CHS # 23750, "Fitness and Sport Skill Outcomes of High School Students who are At-Risk and Students with Special Needs"

This is to acknowledge receipt of your response dated March 23, 2016 to the stipulations issued by the Human Studies Program during its review of the project identified above at its meeting on February 17, 2016. The information you provided satisfactorily addressed the Human Studies Program stipulations, and the project is approved for one year, effective April 26, 2016.

This memorandum is your record of the Human Studies Program approval of this study. Please maintain it with your study records.

The Human Studies Program approval for this project will expire on April 25, 2017. If you expect your project to continue beyond this date, you must submit an application for renewal of this Human Studies Program approval. The Human Studies Program approval must be maintained for the entire term of your project.

If, during the course of your project, you intend to make changes to this study, you must obtain approval from the Human Studies Program prior to implementing any changes. If an Unanticipated Problem occurs during the course of the study, you must notify the Human Studies Program within 24 hours of knowledge of the problem. A formal report must be submitted to the Human Studies Program within 10 days. The definition of "Unanticipated Problem" may be found at: https://manoa.hawaii.edu/researchcompliance/policies-guidance and the report form may be downloaded here: https://manoa.hawaii.edu/researchcompliance/report-protocol-violation-or-unanticipated-problem.

You are required to maintain complete records pertaining to the use of humans as participants in your research. This includes all information or materials conveyed to and received from participants as well as signed consent forms, data, analyses, and results. These records must be maintained for at least three years following project completion or termination, and they are subject to inspection and review by the Human Studies Program and other authorized agencies.

1960 East-West Road
Biomedical Sciences Building B104
Honolulu, Hawai'i 96822
Telephone: (808) 956-5007
Fax: (808) 956-8683

Please notify this office when your project is completed. Upon notification, we will close our files pertaining to your project. Reactivation of the Human Studies Program approval will require a new Human Studies Program application.

Please contact this office if you have any questions or require assistance. We appreciate your cooperation, and wish you success with your research.

Office of Research Compliance
Human Studies Program

UNIVERSITY of HAWAI'I® SYSTEM

MEMORANDUM
CR

April 21, 2017

TO: Allison Tsuchida
Principal Investigator
Kinesiology & Rehabilitation Science

FROM: Norman K. Magno
Interim Director

SUBJECT: CHS #23750- "Fitness and Sport Skill Outcomes of High School Students who are At-Risk and Students with Special Needs"

Under an expedited review procedure, the research project identified above was approved for one year on April 19, 2017 by the University of Hawaii (UH) Human Studies Program. The application qualified for expedited review under CFR 46.110 and 21 CFR 56.110, Category (8a).

This memorandum is your record of the Human Studies Program approval of this study. Please maintain it with your study records.

The Human Studies Program approval for this project will expire on April 18, 2018. If you expect your project to continue beyond this date, you must submit an application for renewal of this Human Studies Program approval. The Human Studies Program approval must be maintained for the entire term of your project.

If, during the course of your project, you intend to make changes to this study, you must obtain approval from the Human Studies Program prior to implementing any changes. If an Unanticipated Problem occurs during the course of the study, you must notify the Human Studies Program within 24 hours of knowledge of the problem. A formal report must be submitted to the Human Studies Program within 10 days. The definition of "Unanticipated Problem" may be found at: https://www.hawaii.edu/researchcompliance/policies-guidance and the report form may be downloaded here: https://www.hawaii.edu/researchcompliance/report-protocol-violation-or-unanticipated-problem.

You are required to maintain complete records pertaining to the use of humans as participants in your research. This includes all information or materials conveyed to and received from participants as well as signed consent forms, data, analyses, and results. These records must be maintained for at least three years following project completion or termination, and they are subject to inspection and review by the Human Studies Program and other authorized agencies.

2425 Campus Road, Sinclair 10
Honolulu, Hawai'i 96822
Telephone: (808) 956-5007 • Fax: (808) 956-9150
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Please notify this office when your project is complete. Upon notification, we will close our files pertaining to your project. Reactivation of the Human Studies Program approval will require a new Human Studies Program application.

Please contact this office if you have any questions or require assistance. We appreciate your cooperation, and wish you success with your research.

Appendix B

Parental Informed Consent

University of Hawai'i
Parental/Guardian's Consent for Child to Participate in Research Project:
Fitness and Sport Skill Outcomes of High School Students who are At-Risk and Students with Special Needs

My name is Nathan Murata and I am a Professor in Kinesiology and Rehabilitation Science Department, College of Education. Along with graduate students Allison Tsuchida and Jim Barry, we are interested investigating whether or not an interscholastic intramural program will improve fitness and sports skill levels of high school students who are at-risk and those with special needs. Your child's participation in their school's Friday Night Lights Inclusive Intramural Program and this study, will involve participation in five team practices and two games. I am asking your permission for your child to participate in this project.

What activities will your child do in the study and how long will the activities last? If your child is in the study, he/she will be participating in an eight-week long basketball program. The program will include an introductory day where your child's fitness skills and basketball skills will be assessed. Your child will be expected to attend five, one hour-long practices and two regulation basketball games. At the conclusion of the basketball program your child will be asked to complete a follow up skills session to look at program success and student improvement. If your child participates, he or she will be one of a total of 20-30 high school students will participate in the program.

Fitness testing will be done using the FITNESSGRAM, fitness test assessment, and will measure: child's height and weight, cardiovascular endurance using the Personal Aerobic Capacity Endurance Run (PACER), a paced curl up test, and a sit and reach flexibility test. For the skills assessment, we will be assessing student performance in dribbling, passing, shooting. If you would like to see a copy of all of the assessments, please contact me via email address listed near the end of this consent form.

Benefits and Risks: The benefits of this program will be an increased physical activity for your child and the opportunity to participate in a school sanctioned athletics program. We also anticipate that other direct benefits that come with participation in this project include greater social interaction amongst peers, support for these students, and overall increased school spirit and pride. The results of this project will help determine the need for future programs for students who are at-risk and students with disabilities. There are minimal if any risks for participation in this study. The risks to your child in participating in this project includes, increased heart rate, increased breathing due to moderate-vigorous physical activity. If this happens your child will be given the opportunity to rest. As in any sport or physical activity participation, there is the risk of incidental injury.

Confidentiality and Privacy: I will keep all the information from the assessments in a safe place. Only my doctoral students and I will have access to the information. Other agencies that have legal permission have the right to review research records. The University of Hawai`i Human Studies Program has the right to review research records for this study.

Participants will be issued a personal code that will used to record student data. The actual test will be locked in a filing cabinet with only the previously mentioned people will have access to.
If you would like a copy of my final report, please contact me at the number listed near the end of this consent form.

In addition, height and weight will be measured fully clothed with a male and female assistant present. Data is collected in this way because we are concerned about protecting the body image of children. Research has also determined that height and weight measurements do not affect children's body image.

Voluntary Participation: Participation in this research project is voluntary. Your child can choose freely to participate or not to participate. You can choose freely whether or not your child may participate in this project. At any point during this project, you can withdraw your permission, and your child can stop participating without any loss of benefits.

Questions: If you have any questions about this project, contact me, Nathan Murata, by phone (808)956-7606 or e-mail (nmurata@hawaii.edu).

If you have questions about your rights, or your child's rights, contact the University of Hawai`i, Human Studies Program, by phone at (808) 956-5007 or by e-mail at uhirb@hawaii.edu.

Please keep the section above for your records.
If you consent for your child to be in this project, please sign the signature section below and return it to your child's teacher.

Tear or cut here

Signature(s) for Consent:

I give permission for my child to join the research project entitled, "Friday Night Lights Inclusive Intramural Program*"*. I understand that my child may change his or her mind about being in the study at any time. I understand that I may change my mind about my child being in the study. I understand that I must tell the researcher of our decision to end stop being in this project.

Name of Child (Print): _____

Name of Parent/Guardian (Print): _____

Parent/Guardian's Signature: _____

Date: _____

Appendix C

Child Assent

University of Hawai'i
Student Assent to Participate in Research Project:
Fitness and Sport Skill Outcomes of High School Students who are At-Risk and Students with Special Needs

The Purpose?
This is a study to determine fitness and sport skill benefits of participation on a High School Sports team.

What will be involved?
We are going to invite you to participate in an 8 Week Basketball Program. Before and after the program, we are going to measure your height and weight, your fitness level, and your basketball skills.

What do I do?
All you need to do is try your best. We will have an introductory session to test your fitness and basketball skills, followed by a minimum of five, one-hour long practice session. After that you will participate in two full basketball games and a final skills workshop, where we will again test your fitness and basketball skills.

Do I have to do it?
No, you do not have to participate, only if you want to. If you wish to stop at any time, you can.

– –

I WANT TO PARTICIPATE!
If you want to be in this study, please print and sign your name.

I want to participate in the research project entitled, "Friday Night Lights Inclusive Intramural Program*"* I understand that my parents must agree to join this study. I understand that I must agree to join this project too. I understand that I may change my mind about my child being in the study. I understand that I must tell the researcher of my decision to end/stop being in this project.

_____
(Your first and last name – printed)

_____ _____
(Sign your first and last name) (Date)

Allison Tsuchida	PH: (808) 956-7606	artsuchi@hawaii.edu
James Barry	PH: (808) 956-7606	barryj@hawaii.edu
Dr. Nathan Murata	PH: (808) 956-4714	nmurata@hawaii.edu

Appendix D

Lessons

Class: Adaptive PE	Period: 6	Date: Monday January 23, 2017 (1)

Activity	• RPE Training
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, & dribbling.**
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students will be able to maintain control of the ball the *majority* of the time while performing ball handling drills. • Students will be able to dribble the ball properly using their preferred hand, across the gym floor through obstacles and back without losing control of the ball for at least 3 out of 5 attempts.

Time	Activity	Notes
5 Min.	Preview class activity and distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

10 Min.	Ready Position
	• Instruct students on proper body positioning for the ready position.
	  ○ Both hands on the ball in front of the chest
	  ○ Elbows out
	  ○ Feet shoulder width apart with knees bent
	• Drill
	  ○ Dribble the ball around the court when I blow my whistle stop dribbling and get into ready position.
	  ○ Repeat drill 5 times
	• Upon completion record HR and RPE
		Cues
		• Watch and listen for my directions
		  ○ Whistle stop and show me ready position.
		  ○ Where should the ball be in ready position?
		  ○ Knees should be?
		  ○ Be ready to move.

5 Min.	Water break and rest	

10 Min.	Ball Handling and Control
	• Instruct students as to what we will be doing on the drill.
	• Body part ball handling drill
	  ○ Move the ball around ball parts using your hands to maintain control of the ball.
	  ▪ Head and neck
	  ▪ Waist
	  ▪ Knees
	  ▪ On the floor around your feet and ankles
	  ▪ Figure 8 between your legs
		Cues
		• Watch and listen for my directions
		  ○ Whistle stop in ready position.
		  ○ Move ball around the designated body parts.
		  ○ Move at a pace/speed that you can still maintain control.

	▪ Repeat body parts twice • Upon completion record HR and RPE	
10 Min.	Dribbling • Instruct students on proper dribbling technique ○ Spread fingers ○ Use pads of the fingers to push ball down with one hand. ○ Do not slap the ball ○ Dribble low, below the waist level. ○ Bend knees slightly ○ Eyes up look ahead, not at the ball ○ On the whistle stop and get into ready position. • Dribbling down and back drill. ○ Dribble down and back ▪ Start with ready position ▪ Using preferred hand ▪ Using non preferred hand ▪ Using alternating hands ○ Dribble down and back weaving through cones ▪ Start with ready position ▪ Using preferred hand ▪ Using non preferred hand ▪ Using alternating hands ▪ Repeat drill 5 times • Upon completion record HR and RPE	Cues ○ Spread fingers ○ Use pads of the fingers to push ball down with one hand. ○ Do not slap the ball ○ Dribble low, below the waist level. ○ Bend knees slightly ○ Eyes up look ahead, not at the ball ○ On the whistle stop and get into ready position.
5 Min.	Closing • Review ○ Proper body position for ready position ▪ Both hands on the ball in front of the chest ▪ Elbows out ▪ Feet shoulder width apart with knees bent ○ Proper dribbling technique ▪ Spread fingers ▪ Use pads of the fingers to push ball down with one hand. ▪ Do not slap the ball ▪ Dribble low, below the waist level. ▪ Bend knees slightly ▪ Eyes up look ahead, not at the ball • Upon completion record HR and RPE • Collect equipment and HR Monitors.	

Class: Adaptive PE	**Period: 6**	**Date: Wednesday January 25, 2017 (2)**

Activity	• Basic Basketball Skills
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, & dribbling.** • Students to develop competence in team court sports (**Basketball)**
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (75%) uses effective ball skills with good technique and control **(ready position, dribbling, passing, catching, & shooting).**

Time	**Activity**	**Notes**
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
5 Min.	Review Ready Position • Instruct students on proper body positioning for the ready position. o Both hands on the ball in front of the chest o Elbows out o Feet shoulder width apart with knees bent • Drill o Dribble the ball around the court when I blow my whistle stop dribbling and get into ready position. o Repeat drill 3 times	Cues • Watch and listen for my directions o Whistle stop and show me ready position. o Where should the ball be in ready position? o Knees should be? o Be ready to move.
5 Min.	Review Ball Handling and Control • Instruct students as to what we will be doing on the drill. • Body part ball handling drill o Move the ball around ball parts using your hands to maintain control of the ball. ▪ Head and neck ▪ Waist ▪ Knees ▪ On the floor around your feet and ankles ▪ Figure 8 between your legs ▪ Repeat body parts twice • Upon completion record HR and RPE	Cues • Watch and listen for my directions o Whistle stop in ready position. o Move ball around the designated body parts. o Move at a pace/speed that you can still maintain control.
5 Min.	Water Break & Rest	
10 Min.	Review Dribbling	Cues

	• Instruct students on proper dribbling technique ○ Spread fingers ○ Use pads of the fingers to push ball down with one hand. ○ Do not slap the ball ○ Dribble low, below the waist level. ○ Bend knees slightly ○ Eyes up look ahead, not at the ball ○ On the whistle stop and get into ready position. • Dribbling down and back drill. ○ Dribble down and back ▪ Start with ready position ▪ Using preferred hand ▪ Using non preferred hand ▪ Using alternating hands ○ Dribble down and back weaving through cones ▪ Start with ready position ▪ Using preferred hand ▪ Using non preferred hand ▪ Using alternating hands ▪ Repeat drill 3 times ○ Dribble spin on the cone ▪ Dribble to cones then use reverse pivot spin and continue dribbling to the next cone. ▪ Students are to use switch use of hands when completing the reverse pivot. ▪ Repeat drill 2 times. • Upon completion record HR and RPE	○ Spread fingers ○ Use pads of the fingers to push ball down with one hand. ○ Do not slap the ball ○ Dribble low, below the waist level. ○ Bend knees slightly ○ Eyes up look ahead, not at the ball ○ On the whistle stop and get into ready position.
10 Min.	Modified ½ court 2 on 2/ 3 on 2 games • Divide class into 6 teams • Have class play modified ½ court games. • Students should be reminded to practice using the skills covered in class. • Students should also be reminded about fair and safe play, and to use teamwork and cooperation. • Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Friday January 27, 2017 (3)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, & dribbling.** • Students to develop competence in team court sports (**Basketball)**	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (75%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, & shooting).**	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

10 Min.	Introduce Pivoting
	• Discuss the rule on traveling
	  ○ Only allowed 1 ½ steps in the game of basketball.
	  ○ Only allowed to move a single foot, while keeping your pivot foot on the ground.
	  ○ You may rotate on your pivot foot.
	• Instruction how to pivot
	  ○ Ready position
	  ○ Establish your pivot foot, the foot that will remain in contact with the ground. You may not change pivot foot once it's been established.
	  ○ Body weight on the ball of your pivot foot, you may rotate on your pivot foot moving forward, or backward (reverse pivot).
	• Pivot Drill
	  ○ Standing in an open area facing the instructor.
	  ○ Using your right foot as the pivot foot, on cadence pivot a quarter turn forward, until we complete one rotation.
	  ○ Switch to left foot as a pivot foot.
	  ○ Repeat sequence using reverse pivot.	

5 Min.	Review Ball Handling and Control
	• Instruct students as to what we will be doing on the drill.
	• Body part ball handling drill
	  ○ Move the ball around ball parts using your hands to maintain control of the ball.
	  ▪ Head and neck
	  ▪ Waist
		Cues
		• Watch and listen for my directions
		  ○ Whistle stop in ready position.
		  ○ Move ball around the designated body parts.
		  ○ Move at a pace/speed that you can still maintain control.

	▪ Knees ▪ On the floor around your feet and ankles ▪ Figure 8 between your legs ▪ Repeat body parts twice • Upon completion record HR and RPE	
10 Min.	Review Dribbling • Instruct students on proper dribbling technique o Spread fingers o Use pads of the fingers to push ball down with one hand. o Do not slap the ball o Dribble low, below the waist level. o Bend knees slightly o Eyes up look ahead, not at the ball o On the whistle stop and get into ready position. • Dribbling down and back drill. o Dribble down and back ▪ Start with ready position ▪ Using preferred hand ▪ Using non preferred hand ▪ Using alternating hands o Dribble down and back weaving through cones ▪ Start with ready position ▪ Using preferred hand ▪ Using non preferred hand ▪ Using alternating hands ▪ Repeat drill 3 times o Dribble spin on the cone ▪ Dribble to cones then use reverse pivot spin and continue dribbling to the next cone. ▪ Students are to use switch use of hands when completing the reverse pivot. ▪ Repeat drill 2 times. • Upon completion record HR and RPE	Cues o Spread fingers o Use pads of the fingers to push ball down with one hand. o Do not slap the ball o Dribble low, below the waist level. o Bend knees slightly o Eyes up look ahead, not at the ball o On the whistle stop and get into ready position.
10 Min.	Modified ½ court 2 on 2/ 3 on 2 games • Divide class into 6 teams • Have class play modified ½ court games. • Students should be reminded to practice using the skills covered in class. • Students should also be reminded about fair and safe play, and to use teamwork and cooperation. • Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Tuesday January 31, 2017 (4)

Activity	• Basic Basketball Skills
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching.** • Students to develop competence in team court sports (**Basketball)**
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (75%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, & shooting).**

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

10 Min.	Introduce Passing & Catching
	• Basic Passes Used in Basketball
	  ○ Chest pass
	  ▪ Start in ready position
	  ▪ Hands placed on the sides of the ball
	  ▪ Ball close to chest
	  ▪ Elbows out
	  ▪ Step with a single foot toward your partner
	  ▪ Extending arms, pushing ball away from chest.
	  ▪ Ball should arrive at your partner's chest level.
	  ○ Chest bounce pass
	  ▪ Start in ready position
	  ▪ Hands placed on the sides of the ball
	  ▪ Ball close to chest
	  ▪ Elbows out
	  ▪ Step with a single foot toward your partner
	  ▪ Extending arms, pushing ball away from chest.
	  ▪ Ball should bounce ¾ the distance between you and your partner arriving at waist level of your partner.
	  ○ Overhead pass
	  ▪ Start in ready position
	  ▪ Hands placed on the side of the ball
	  ▪ Elevate the ball above your head
	  ▪ Step with a single foot forward toward your partner
	  ▪ Pull the ball forward with your arms, extending your arms toward your partner.
	  ▪ Ball should arrive at your partner's chest level or slightly higher.	

	• Catching
	  ○ Start in ready position
	  ○ Hands and arms should extend slightly in front of your body.
	  ○ Visually tract the flight of the ball moving hands into the path of the ball.
	  ○ Cushion the impact of the ball when ball hits your hands to make it easier to grasp the ball.
	• Drill 1 with Partner 15 feet apart
	  ○ Practice the basic 3 passes
	  ○ Practice catching technique
	• Upon completion record HR and RPE	

5 Min.	Water Break	

10 Min.	• Drill 2 passing with shuffle
	  ○ With a partner shuffle down court using the 3 basic passes and use proper catching technique.
	  ▪ Chest pass
	  ▪ Chest bounce pass
	  ▪ Overhead pass
	  ▪ Use proper catching technique
	• Upon completion record HR and RPE	

10 Min.	Drill 3 Offensive Perimeter Passing with Shooting • Groups of 4, using 4 baskets on outdoor courts. • Align on cones set on the perimeter of the key. • Pass the ball around the perimeter to team members. • When I blow my whistle the person who has the ball shoots the ball at the basket. • Players will rotate one cone clockwise after each shot. • Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thursday February 2, 2017 (5)

Activity	• Basic Basketball Skills
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching.** • Students to develop competence in team court sports (**Basketball)**
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (75%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, & shooting).**

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

5 Min.	Review Passing & Catching
	• Basic Passes Used in Basketball
	  ○ Chest pass
	  ▪ Start in ready position
	  ▪ Hands placed on the sides of the ball
	  ▪ Ball close to chest
	  ▪ Elbows out
	  ▪ Step with a single foot toward your partner
	  ▪ Extending arms, pushing ball away from chest.
	  ▪ Ball should arrive at your partner's chest level.
	  ○ Chest bounce pass
	  ▪ Start in ready position
	  ▪ Hands placed on the sides of the ball
	  ▪ Ball close to chest
	  ▪ Elbows out
	  ▪ Step with a single foot toward your partner
	  ▪ Extending arms, pushing ball away from chest.
	  ▪ Ball should bounce ¾ the distance between you and your partner arriving at waist level of your partner.
	  ○ Overhead pass
	  ▪ Start in ready position
	  ▪ Hands placed on the side of the ball
	  ▪ Elevate the ball above your head
	  ▪ Step with a single foot forward toward your partner
	  ▪ Pull the ball forward with your arms, extending your arms toward your partner.
	  ▪ Ball should arrive at your partner's chest level or slightly higher.	

	• Catching
	  ○ Start in ready position
	  ○ Hands and arms should extend slightly in front of your body.
	  ○ Visually tract the flight of the ball moving hands into the path of the ball.
	  ○ Cushion the impact of the ball when ball hits your hands to make it easier to grasp the ball.
	• Drill 1 with Partner 15 feet apart
	  ○ Practice the basic 3 passes
	  ○ Practice catching technique	

5 Min.	• Drill 2 passing with shuffle
	  ○ With a partner shuffle down court using the 3 basic passes and use proper catching technique.
	  ▪ Chest pass
	  ▪ Chest bounce pass
	  ▪ Overhead pass
	  ▪ Use proper catching technique
	• Upon completion record HR and RPE	

3 Min.	Water Break	
10 Min.	2 vs 2 Monkeys in the Middle • Offensive objective to maintain possession of the ball while passing ball with partner. • Defensive objective to attempt to steal the ball from the offense. • If defense is successful in stealing the ball, they are to switch roles with their opponents. • Team who possesses the ball may shoot the ball when a coach calls out to shoot. • Upon completion record HR and RPE	
10 Min.	Dribble, Pass, Catch, Pivot, & Pass Drill • 2 lines on each side of the court marked with cones. ○ Dribbling line, and high post line. • Student to dribble ball down court and stop at designated cone. • Chest pass to high post player. • High post player will pivot and deliver a bounce pass to the dribbler breaking to the basket. • Dribbler to take a shot at basket. • Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Monday February 6, 2017 (6)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & rebounding.** • Students to develop competence in team court sports (**Basketball)**	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & rebounding).**	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

5 Min.	Review Dribbling
	• Dribbling down & back the width of the court…
	  ○ Using preferred hand
	  ○ Non-preferred hand
	  ○ Alternating hands
	  ○ Rep 3 times each.	

5 Min.	Review Passing
	• With a partner shuffle down court using the 3 basic passes and use proper catching technique.
	  ▪ Chest pass
	  ▪ Chest bounce pass
	  ▪ Overhead pass
	  ▪ Use proper catching technique
	  ▪ Rep each type of pass 1 time.
	• Upon completion record HR and RPE	

3 Min.	Water Break	
10 Min.	Introduce shooting. • Hand position: preferred hand behind and under the ball, other hand on the side of the ball to aid in balance & control. • Knees should be bent in ready positon • Align ball & shoulders with basket. • Extend legs arm and shoulders releasing the ball off the finger tips. • Ball should travel in the air like a Rainbow in the sky	

	towards the basket. Horseshoe Shooting Drill • Make a single shot from each cone that is aligned around the basket. • Make a shot then move on to the next cone. • 3 people at each basket.	
10 Min.	Dribble, Pass, Catch, Pivot, & Pass Drill • 2 lines on each side of the court marked with cones. ○ Dribbling line, and high post line. • Student to dribble ball down court and stop at designated cone. • Chest pass to high post player. • High post player will pivot and deliver a bounce pass to the dribbler breaking to the basket. • Dribbler to take a shot at basket. • Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thursday February 9, 2017 (7)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & rebounding.** • Students to develop competence in team court sports (**Basketball)**	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & rebounding).**	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Dribble, Pass, Catch, Pivot, & Pass Drill • 2 lines on each side of the court marked with cones. ○ Dribbling line, and high post line. • Student to dribble ball down court and stop at designated cone. • Chest pass to high post player. • High post player will pivot and deliver a bounce pass to the dribbler breaking to the basket. • Dribbler to take a shot at basket. • Upon completion record HR and RPE	
3 Min.	Water Break	
10 Min.	Introduce shooting. • Hand position: preferred hand behind and under the ball, other hand on the side of the ball to aid in balance & control. • Knees should be bent in ready positon • Align ball & shoulders with basket. • Extend legs arm and shoulders releasing the ball off the finger tips. • Ball should travel in the air like a Rainbow in the sky towards the basket. Horseshoe Shooting Drill • Make a single shot from each cone that is aligned around the basket. • Make a shot then move on to the next cone. • 3 people at each basket.	

10 Min	1 on 1 Rebound drill • Instructor/Aid to shoot basketball w/ two students attempting to rebound and maintain control of the ball. • Questions students as to what can they do to put themselves in an advantageous position to get the ball. • Person who rebounds ball shall dribble to the other half of the court to shoot the ball (fastbreak). • Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Tuesday February 14, 2017 (8)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & rebounding.** • Students to develop competence in team court sports (**Basketball)**	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & rebounding)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	1 on 1 Rebound drill • Instructor/Aid to shoot basketball w/ two students attempting to rebound and maintain control of the ball. • Questions students as to what can they do to put themselves in an advantageous position to get the ball. • Person who rebounds ball shall dribble to the other half of the court to shoot the ball (fastbreak). • Upon completion record HR and RPE	
3 Min.	Water Break	
10 Min.	Review shooting. • Hand position: preferred hand behind and under the ball, other hand on the side of the ball to aid in balance & control. • Knees should be bent in ready positon • Align ball & shoulders with basket. • Extend legs arm and shoulders releasing the ball off the finger tips. • Ball should travel in the air like a Rainbow in the sky towards the basket. Horseshoe Shooting Drill • Make a single shot from each cone that is aligned around the basket. • Make a shot then move on to the next cone. • 3 people at each basket. • Upon completion record HR and RPE	

10 Min	3 on 3 ½ court modified game • Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thurs February 16, 2017 (9)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports (**Trashcanball)**	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Clean out the Backyard with Defenders (defense) • 3 trash cans placed in areas of the court • Assign 3 defenders of the can, 1 at each can • Other students are to pick up balls and try to place them in the trash can. • Students may only move by dribbling. • Students have 1 min to put as many balls as they can into the trash cans. • Upon completion record HR and RPE	
3 Min.	Water Break	
10 Min.	• 3 on 3 ½ court Trashcanball (passing & defense) • Offense may only move the ball through passing • Objective to advance the ball with teammates through passing and scoring by getting the ball into the can. • Defenders objective to steal or block the ball from getting into the trashcan. • Upon completion record HR and RPE	
10 Min	3 on 3 full court Trashcanball (passing & defense) • Offense may only move the ball through passing • Objective to advance the ball with teammates through passing and scoring by getting the ball into the can. • Defenders objective to steal or block the ball from getting into the trashcan. • Upon completion record HR and RPE	
5 Min.	Closing - Collect HR monitors.	

Class: Adaptive PE		Period: 6	Date: Tuesday February 21, 2017 (10)
Activity	• Basic Basketball Skills		
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports (**Trashcanball)**		
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.		

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
8 Min.	Clean out the Backyard with Defenders (defense) • 3 trash cans placed in areas of the court • Assign 3 defenders of the can, 1 at each can • Other students are to pick up balls and try to place them in the trash can. • Students may only move by dribbling. • Students have 1 min to put as many balls as they can into the trash cans.	
3 Min.	Water Break	
8 Min.	• 3 on 3 ½ court Trashcanball (passing & defense) • Offense may only move the ball through passing • Objective to advance the ball with teammates through passing and scoring by getting the ball into the can. • Defenders objective to steal or block the ball from getting into the trashcan. • Upon completion record HR and RPE	
10 Min	3 on 3 full court Trashcanball (passing & defense) • Offense may only move the ball through passing • Objective to advance the ball with teammates through passing and scoring by getting the ball into the can. • Defenders objective to steal or block the ball from getting into the trashcan. • Upon completion record HR and RPE	
10 Min.	3 on 3 Full court Modified Basketball (Foam Ball, only passing) • Offense may only move the ball through passing	

	• Objective to advance the ball with teammates through passing and scoring by getting the ball into the can. • Defenders objective to steal or block the ball from getting into the trashcan. Upon completion record HR and RPE	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE		Period: 6	Date: Thursday February 23, 2017 (11)
Activity	• Basic Basketball Skills		
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.		
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.		

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Dribble Tip Over (Dribbling) • ½ the class will be working on dribbling • ½ the class to defend and pick-up knocked over cones • Dribblers are to dribble around the court attempting to knock over all the cones using their hands. • Defenders are to defend cones from getting knocked over or get them replaced if they get knocked over. • Rotate offensive and defensive players. • Upon completion record HR and RPE.	
3 Min.	Water Break	
10 Min.	Pirates (Dribbling) • 3 students will be selected to be the pirates. • Remainder of the class will be dribbling their basketball within the boundaries of the court without it getting stolen from a pirate. • Pirates are to attempt to steal a ball away from an offensive player dribbling on the court. • If a pirate steals a ball he/she becomes the dribbling offensive player and the offensive player now becomes the pirate. • Upon completion record HR and RPE.	
10 Min	Shooting Trail (Shooting) • Each individual should work their way around the gym shooting from a variety of cones set up for each basket. • Students are to rotate to a new basket after making a	

	basket and shoot from a new spot. • Students are to keep rotating and moving from basket to basket. • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE		Period: 6	Date: Monday February 26, 2017 (12)
Activity	• Basic Basketball Skills		
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.		
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.		

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
8 Min.	Dribble Tip Over (Dribbling) • ½ the class will be working on dribbling • ½ the class to defend and pick-up knocked over cones • Dribblers are to dribble around the court attempting to knock over all the cones using their hands. • Defenders are to defend cones from getting knocked over or get them replaced if they get knocked over. • Rotate offensive and defensive players. • Upon completion record HR and RPE.	
3 Min.	Water Break	
8 Min.	Pirates (Dribbling) • 3 students will be selected to be the pirates. • Remainder of the class will be dribbling their basketball within the boundaries of the court without it getting stolen from a pirate. • Pirates are to attempt to steal a ball away from an offensive player dribbling on the court. • If a pirate steals a ball he/she becomes the dribbling offensive player and the offensive player now becomes the pirate. • Upon completion record HR and RPE.	
10 Min	Shooting Trail (Shooting) • Each individual should work their way around the gym shooting from a variety of cones set up for each basket. • Students are to rotate to a new basket after making a	

	basket and shoot from a new spot. • Students are to keep rotating and moving from basket to basket. • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thursday March 2, 2017 (13)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Line Passing Shuffle Dribble Shoot • Single line aligned the length of the court on ½ of the court. • A single student will work on basic passing by passing to teammates and shuffling down the line. • When the individual reaches the end of the line he/she will dribble to the basket and take a shot. • Upon completion record HR and RPE.	X X X X X X X >>>>>
3 Min.	Water Break	
10 Min.	1 on 1 Rebound Fastbreak Drill • Instructor/Aid to shoot basketball w/ two students attempting to rebound and maintain control of the ball. • Questions students as to what can they do to put themselves in a advantageous position to get the ball. • Person who rebounds ball shall dribble to the other half of the court to shoot the ball (fastbreak). Upon completion record HR and RPE	
10 Min	3 on 3 Fastbreak drill • 3 Defenders at opposite basket • 3 rebounders at near basketball. • Rebounders are to rebound and advance the all down court and attempt to score. • Defenders are to attempt to stop offensive team from scoring. • Upon completion record HR and RPE.	
5 Min.	Closing -Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thursday March 6, 2017 (14)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Line Passing Shuffle Dribble Shoot • Single line aligned the length of the court on ½ of the court. • A single student will work on basic passing by passing to teammates and shuffling down the line. • When the individual reaches the end of the line he/she will dribble to the basket and take a shot. • Upon completion record HR and RPE.	X X X X X X X >>>>>
3 Min.	Water Break	
10 Min.	3 Person Fastbreak Drill • Align on 3 cones • Person in the center is to initiate the fastbreak by passing the ball to either person on the side • Person on the side shall pass the ball back to the middle person, who will then pass the ball to the opposite person. • This should be repeated until they get close to the basket where one of the 3 will take a shot. Upon completion record HR and RPE	
10 Min	3 on 3 ½ court scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thursday March 8, 2017 (15)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Individual Dribble Fastbreak Drill • Rebound • Students are to dribble as fast as they can to the opposite side basket and attempt shoot (execute a layup?) the basketball. • Shots should be taken near the basket (within 5 Ft.) Upon completion record HR and RPE.	
3 Min.	Water Break	
10 Min.	Pirates (Dribbling) • 3 students will be selected to be the pirates. • Remainder of the class will be dribbling their basketball within the boundaries of the court without it getting stolen from a pirate. • Pirates are to attempt to steal a ball away from an offensive player dribbling on the court. • If a pirate steals a ball he/she becomes the dribbling offensive player and the offensive player now becomes the pirate. Upon completion record HR and RPE.	
10 Min	3 on 3 ½ court scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Friday March 10, 2017 (16)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Make 3 from Each Spot • Divide class into • Students are to make 3 shots from marked spots on the court then move on to the next spot. • Each basket area will be marked with 3 spots to shoot from. • Students who are having difficulty should attempt shots from near then progress to far. Upon completion record HR and RPE.	
3 Min.	Water Break	
10 Min.	Rebound Fastbreak Pick a Spot • Student to rebound basketball and dribble to far court where he/she will select a marked sport to take a shot. • Students who are having difficulty should attempt shots from near then progress to far. Upon completion record HR and RPE.	
10 Min	3 on 3 ½ court scrimmages • Upon completion record HR and RPE.	
Note	**Rainy day: J-3 work on dibbling and finish with trashcanball.**	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Tuesday March 14, 2017 (17)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Dribble Tip Over (Dribbling) • ½ the class will be working on dribbling • ½ the class to defend and pick-up knocked over cones • Dribblers are to dribble around the court attempting to knock over all the cones using their hands. • Defenders are to defend cones from getting knocked over or get them replaced if they get knocked over. • Rotate offensive and defensive players. Upon completion record HR and RPE.	
3 Min.	Water Break	
10 Min.	1-2-2 Formation Passing with Shooting • 5 Students to align in an offensive 1-2-2 formation • Students are to work on their passing skills by passing ball around to teammates. • When whistle is blown the person with the ball should attempt a shot at the basket. • After each shot attempt students shall rotate one position clockwise. Upon completion record HR and RPE.	
10 Min	3 on 3 ½ court scrimmages • Upon completion record HR and RPE.	
Note	**Rainy day: J-3 work on dibbling and finish with trashcanball.**	
5 Min.	Closing - Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thursday March 16, 2017 (18)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Pirates (Dribbling) • 3 students will be selected to be the pirates. • Remainder of the class will be dribbling their basketball within the boundaries of the court without it getting stolen from a pirate. • Pirates are to attempt to steal a ball away from an offensive player dribbling on the court. • If a pirate steals a ball he/she becomes the dribbling offensive player and the offensive player now becomes the pirate. Upon completion record HR and RPE.	
3 Min.	Water Break	
10 Min.	1-2-2 Formation Passing with Shooting • 5 Students to align in an offensive 1-2-2 formation • Students are to work on their passing skills by passing ball around to teammates. • When whistle is blown the person with the ball should attempt a shot at the basket. • After each shot attempt students shall rotate one position clockwise. Upon completion record HR and RPE.	
10 Min	3 on 3 ½ court scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Tuesday March 28, 2017 (19)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Drill 2 passing with shuffle ○ With a partner shuffle down court using the 3 basic passes and use proper catching technique. ▪ Chest pass ▪ Chest bounce pass ▪ Overhead pass ▪ Use proper catching technique Upon completion record HR and RPE	
3 Min.	Water Break	
10 Min.	1-2-2 Formation Passing with Shooting • 5 Students to align in an offensive 1-2-2 formation • Students are to work on their passing skills by passing ball around to teammates. • When whistle is blown the person with the ball should attempt a shot at the basket. • After each shot attempt students shall rotate one position clockwise. Upon completion record HR and RPE.	
10 Min	4 on 4 Full scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Thursday March 30, 2017 (20)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	
10 Min.	Drill 2 passing with shuffle ○ With a partner shuffle down court using the 3 basic passes and use proper catching technique. ▪ Chest pass ▪ Chest bounce pass ▪ Overhead pass ▪ Use proper catching technique Upon completion record HR and RPE	
3 Min.	Water Break	
10 Min.	1 on 1 Rebound drill • Instructor/Aid to shoot basketball w/ two students attempting to rebound and maintain control of the ball. • Questions students as to what can they do to put themselves in a advantageous position to get the ball. • Person who rebounds ball shall dribble to the other half of the court to shoot the ball (fastbreak). Upon completion record HR and RPE	
10 Min	4 on 4 Full scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Monday April 3, 2017 (21)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

10 Min.	6 Basket Shooting Circuit
	• Students are to take a single shot at a basket and then dribble clockwise to the next basket to take a shot.
	• After 4 min. switch direction counter clockwise.
	  ○ Focus on speed and control when dribbling
	  ○ Shoot the ball like a rainbow
	  ○ Use your legs and push
	Upon completion record HR and RPE	

3 Min.	Water Break	
10 Min.	1 on 1 Rebound drill • Instructor/Aid to shoot basketball w/ two students attempting to rebound and maintain control of the ball. • Questions students as to what can they do to put themselves in a advantageous position to get the ball. • Person who rebounds ball shall dribble to the other half of the court to shoot the ball (fastbreak). Upon completion record HR and RPE	
10 Min	4 on 4 Full scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Wednesday April 5, 2017 (22)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

10 Min.	6 Basket Shooting Circuit
	• Students are to take a single shot at a basket and then dribble clockwise to the next basket to take a shot.
	• After 4 min. switch direction counter clockwise.
	  ○ Focus on speed and control when dribbling
	  ○ Shoot the ball like a rainbow
	  ○ Use your legs and push
	Upon completion record HR and RPE	

3 Min.	Water Break	
10 Min.	1 on 1 Rebound drill • Instructor/Aid to shoot basketball w/ two students attempting to rebound and maintain control of the ball. • Questions students as to what can they do to put themselves in a advantageous position to get the ball. • Person who rebounds ball shall dribble to the other half of the court to shoot the ball (fastbreak). Upon completion record HR and RPE	
10 Min	4 on 4 Full scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Class: Adaptive PE	Period: 6	Date: Wednesday April 7, 2017 (23)
Activity	• Basic Basketball Skills	
Goals	• Student will develop their level of **health related physical fitness**. • Student will develop their level of **skill related physical fitness.** • Students to develop basic basketball skills, specifically **ready position, ball handling, pivoting, dribbling, passing & catching, shooting & defending.** • Students to develop competence in team court sports.	
Objectives	• Students will be able to demonstrate the proper ready position *3 out 5* attempts when prompted to during the ready positon drill. • Students usually (60%) uses effective ball skills with good technique and control **(ready position, dribbling, pivoting, passing & catching, shooting, & defending)** during modified game play.	

Time	Activity	Notes
5 Min.	Distribute HR monitors	
10 Min.	Warm-up • Walking Lunges, Side Lunges, Knee Tucks, Quad Stretch, Leg Kicks, Spider Crawls, High Knees, Skips, Backwards Run, Side Shuffles (2), Get Offs. • Upon completion record HR and RPE	

10 Min.	6 Basket Shooting Circuit
	• Students are to take a single shot at a basket and then dribble clockwise to the next basket to take a shot.
	• After 4 min. switch direction counter clockwise.
	  ○ Focus on speed and control when dribbling
	  ○ Shoot the ball like a rainbow
	  ○ Use your legs and push
	Upon completion record HR and RPE	

3 Min.	Water Break	
10 Min.	1 on 1 Rebound drill • Instructor/Aid to shoot basketball w/ two students attempting to rebound and maintain control of the ball. • Questions students as to what can they do to put themselves in a advantageous position to get the ball. • Person who rebounds ball shall dribble to the other half of the court to shoot the ball (fastbreak). Upon completion record HR and RPE	
10 Min	4 on 4 Full scrimmages • Upon completion record HR and RPE.	
5 Min.	Closing • Collect HR monitors.	

Appendix E

Treatment Integrity Checklist

Session Number _____ Observer Initials _____ Date _____

Lesson Component	Yes	No	N/A
Introduce lesson topic			
RPE refresher (if needed for the day)			
Demonstration of proper technique or explanation of rules for each activity			
Check for understanding for each activity			
Closing/Summary			
Stuck to lesson plan			

Appendix F

Social Validity Questionnaires

Basketball Program Teacher/Coach Social Validity Questionnaire

Please mark an "X" on the line for each question to identify the best answer.

1. Do you think there is a need for programs specifically designed to increase physical activity among adolescents with disabilities?

_____ Yes

_____ No

2. Do you believe the basketball program produced positive outcomes for the participants?

_____ Yes

_____ No

3. Do you think this type of program could have promise as part of the school offerings for adolescents with disabilities?

_____ Yes

_____ No

4. Do you believe the participants enjoyed the basketball program?

_____ Yes

_____ No

Please use the following space to provide comments on the following:

I. What do you consider were the benefits of the physical activity program?

_____

_____

_____

II. What could have been improved?

Friday Night Lights Intramural Basketball Program 2017

Team Prime Time Questionnaire for Athletes

Dear athlete, please use this survey to tell us about you and your experience with the Varsity Games.

1. What is the name of the school you go to?

   _____

2. How old are you? _____

3. Are you a boy or a girl? _____

4. What grade are you in? _____

5. Please circle Varsity Games teams you played on this year. Please circle both if you played on both.

   Soccer Basketball

The next pages ask you to talk about **HOW YOU FEEL and HOW YOU THINK about** Team Prime Time and the Varsity Games.

1

These questions ask **HOW YOU FEEL** about parts of TPT and Varsity Games.

Please CIRCLE the picture and words that show HOW YOU FEEL …

1. How did your sport make you feel?


Really Happy


Happy


Not so happy


Didn't like it at all

2. How did you feel about the team uniforms?


Really Happy


Happy


Not so happy


Didn't like it at all

3. How did you feel about your coach - teammate?


Really Happy


Happy


Not so happy


Didn't like it at all

4. How did you feel about playing in the games against other schools?


Really Happy


Happy


Not so happy


Didn't like it at all

2

6. How did you feel about the competitiveness of the games?

7. How did you feel when you saw your teammates wearing the team sweatshirt at school?

8. How do you feel about your self-confidence at school?

3

These questions ask about **WHAT YOU THINK** about TPT and Varsity Games

Please CIRCLE the picture and words that show HOW YOU THINK …

9. Did you become a better player because you were on the team?


Absolutely Yes


Yes


A Little


Not at All

10. Did you make new friends because you played on these teams?


Absolutely Yes


Yes


A Little


Not at All

11. Do you have more school pride because you played on these teams?


Absolutely Yes


Yes


A Little


Not at All

12. Do you feel like a more important person at school because you played on a team?


Absolutely Yes


Yes


A Little


Not at All

4

13. Do more students at school know who you are because you played on a team?

14. Do you think there is at least one teacher or adult you can talk to in your school if you have a problem?

15. Do you think people at your school are friendlier since joining the team?

16. Do you want to do more activities at school since you played on a team?

5

17. Do you think you are treated with as much respect as other students in school?

18. Do you want to go to school more because you were on the team?

19. Do you feel like you want to play sports after high school more than you did before joining the team?

20. Is high school more fun because you joined a team?

21. Do you want to stay in school more because you joined a team?

22. Do you feel more accepted on campus because you were on the team?

23. Do you have more friends because you played on these teams?

24. Do you want to play these sports again at your school?

25. Does being on a team make you want to do better in school?

7

Overall, please rate your level of satisfaction with the program

What are things you liked most about the program?

_____

What are things you would like us to do differently?

_____

What other sports would you like to play?

_____

What other activities would you like to do after school besides sports?

_____

8

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